JOURNAL
OF THE
Association *of* American Medical Colleges

Volume 21 MARCH, 1946 Number 2

Visual Technics in Medical Education*

TOM JONES
Professor of Medical and Dental Illustration, University of Illinois
Colleges of Medicine and Dentistry
Chicago, Illinois

This is a preliminary report covering an inquiry into visual instruction in medicine which began about five years ago. It will summarize briefly a few of the more significant basic aspects of the subject and attempt to estimate present trends and future prospects.

The study grew out of a dissatisfaction with things as they were, and a conviction that something should be done about it. Perhaps, subconsciously, the desire to expiate my own sins as a medical illustrator was a factor also in driving me to examine more closely the nature of our profession and its relation to medical education. For, obviously, medical illustration existed as part and parcel of our teaching machinery and must be judged on the basis of the service it was rendering to the communication of medical knowledge. As a profession we seemed to be losing sight of this, for all around us progress was being made in the development and use of visual media in other fields while we sat in our studios and drew pictures, apparently oblivious to the wider responsibilities which we should have assumed. Times were changing and we were standing still. Apathy also seemed to exist among medical educators in so far as any widespread interest in newer teaching methods was concerned. Instructors too often were reluctant to abandon the conservative technics of the lecture hall and to adventure into pathways of communication which were being explored with profit by business and industry and in fields of teaching other than medicine.

Then the war came and the truth of the old saying that chickens come home to roost was made clear to us. A great many men and women were suddenly needed in the various branches of the medical and other services, and they had to be trained quickly. Peace time methods could not do the job fast or efficiently enough and the professional educators had little else to offer. They were caught flat-footed. That the job was done, and done brilliantly, is now history, but to get it done the Army and Navy had to step in and apply teaching technics which we had not quite caught up with. There was nothing basically new about the methods they used. It was simply the intelligent application of visual aids on a scale never before known. They used motion pictures, film strips, lantern slides,

* Read at the Fifty-sixth Annual Meeting of the Association of American Medical Colleges, held in Pittsburgh, October 29-31, 1945.

drawings, photographs, models, charts, posters, even cartoons and comic strips, and it worked. Several million men were trained in special and technical services in something less than two-thirds the time required by conventional methods. We may debate the thoroughness of this training and question its application to civilian education, but I have yet to find anyone in the military services, from generals to buck privates, who is not sold 100 per cent on the technics which they used.

My own efforts to learn more about the effectiveness of graphic media and how they were being used in our medical schools, which had been necessarily limited by routine departmental duties, were greatly extended in 1943 by a special fund given the University of Illinois by Dr. A. E. Hertzler. The purpose of the fund was to promote the study of visual instruction in medicine and to make possible a survey which would be comprehensive enough to contribute something of value to medical education.

It has been difficult during the war to find time for first hand study and observation of the practices and experiences in our far flung medical institutions, but the survey is under way and progress is being made. Some traveling has been done and much literature reviewed. There is not much, however, which one can learn about true visual teaching technics from the published works of the past. Apparently, the more important developments and concepts applicable to our problems are too recent. A good many experiments have been made in grade schools and a few in high schools and colleges, but nearly all were made with the idea of determining the teaching value of motion picture films. These data are helpful, as are the experimental studies made by museums, advertising and other business groups. The knowledge which we in medicine have gained is largely empirical and up to the present no systematic effort has been made to study the nature and effectiveness of visual media. It is encouraging, however, to find a growing number of individual teachers in medical schools who are interested and who are experimenting in their class rooms with excellent results.

There are many signs that we are becoming awakened to the importance of the visual pathways of teaching. More and more of our institutions are adding illustrators and photographers to their staffs and within the last few months three medical schools announced plans to establish departments geared to supply the variety of visual aids needed for their teaching program. Being asked to advise on two of these, it was a pleasure to find the committees alert to the value of such departments, not only to their teaching but to their research activities as well. Experience has shown that access to the facilities of a really good illustration studio is a practical factor of no mean importance in encouraging research and the publication of papers and books. Other signs are the growing use of visual aids in national and state public health agencies and the interest that is being shown in some of our cities in developing museums of health and hygiene.

Perhaps, the most significant evidence of all that we are making progress is the formation this summer of the Association of Medical Illustrators. The brief notices of this which appeared could not tell of the discussions which took place

at our meeting in Chicago and which revealed a very clear appreciation of the relation and responsibility of our profession to medical education. May I quote here from the constitution which was adopted.

"OBJECTS AND AIMS: To promote the study, and to encourage the advancement of medical illustration and allied fields of visual education, to promote understanding and cooperation with the medical and dental professions, including public health and nursing, and to advance medical education."

It is clear that we are no longer standing still. Galvanized by our war learned lesson, we are giving more attention to the visual avenues of teaching than ever before. From a quantitative point of view much progress can be seen. Although optimistic over the future, I am not unduly impressed with certain aspects of this progress. It has a surface quality, and its roots have not gone deep enough for the job that lies ahead in the postwar world. It seems to me that those of us responsible for the design and the production of visual aids will have to develop a broader outlook and obtain a higher degree of training than is now available if we are to meet those responsibilities. We will need the encouragement and cooperation of the teachers who, in turn, will need to study the utilization of these media to meet educational ends. Most of us have probably been too preoccupied with the materials of visual techniques to look behind the scenes and try to find out how, why and when they work.

It is through the machinery of the mind that efforts to impart knowledge and ideas are rejected or transmuted into the pure gold of understanding and action. We do not know a great deal about this complex mechanism but the little that we do know is profoundly significant. We know, for instance, that our efforts to teach are good or bad according to the depth and penetration of the understanding or sensory perceptions which we aim to establish. We know that the quality of these perceptions can, to a large extent, be shaped by the choice we make of the media we use and by the principles of repetition, variety, emphasis and many other factors which we can control. Memory exists in different degrees and to quote from Henri Bergson, "It can be reeled out in action or wound up into pure knowledge." In the form of perceptions, "It offers to the sensory motor mechanisms all the recollections capable of guiding them in their task and of giving to the motor reaction the direction suggested by the lessons of experience." The more we study the nature of memory and the physiology of understanding, the broader will become our appreciation of the part played by all media and the better we will be able to engineer and administer our teaching machinery. Before many years have passed, I think we may learn more about the persistence of memory and the law and order that prevails in the vast domain of the mind. Some of our previously held ideas may change, and we will probably become more objective and better able to evaluate all media, visual and otherwise. We will learn to use them as the carpenter uses his tools, singly or in combination, according to their fitness for the job at hand. When this time comes, visual instruction will no longer be regarded as a separate entity but will be accepted as an integral part of medical education. (Fig. 1.)

At present, there is considerable difference of opinion in medical circles

regarding the relative value of certain visual aids. It is not uncommon to find teachers of the same subject in different schools holding diametrically opposite views on the efficiency of charts, motion pictures, moulages or some other medium. I enjoy these arguments and can always learn something from them. They also serve to emphasize the need for more dependable information regarding the limitations of the various media and for a better appraisal of their teaching potentialities.

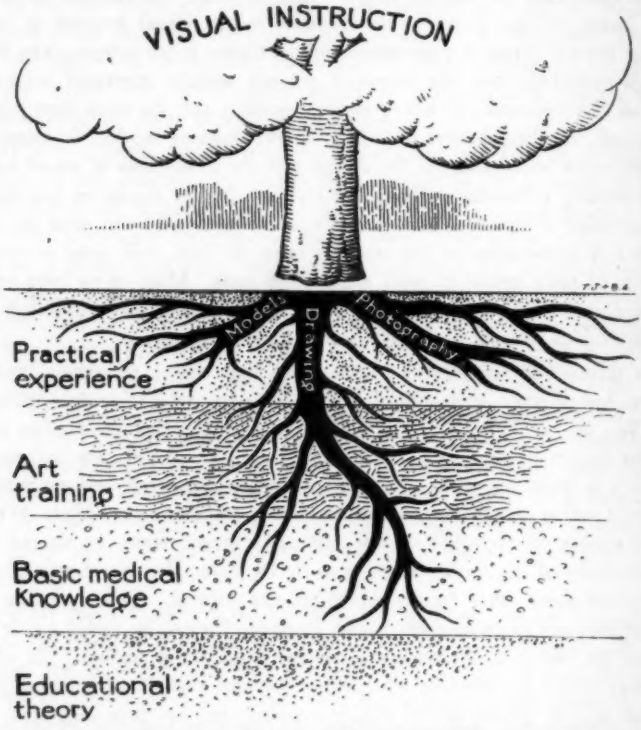

FIGURE 1.—Illustrating present day inadequacy of training of artists and craftsmen professionally engaged in producing visual aids to medicine. The roots shown represent the three general classifications and cover all allied activities in each field (e. g. motion pictures are included in photography, etc.).

One of the important by-products of research in visual technics is a heightened appreciation of words. We learn quickly that they are an interrelated and indispensable factor and in written form are closely akin to the visual itself. When used accurately and with discretion, words can reinforce and clarify to a very high degree the meaning and significance of any type of pictorial representation. The success of an exhibit, for instance, is frequently dependent on the quality and quantity of the words used. Its purpose can be defeated by an overly large amount of explanatory language and lettered panels. It can also fail if the objects and specimens displayed are not explained adequately. The exhibit

form of instruction, which has been growing rapidly in popularity, offers an excellent opportunity to study, under controlled conditions, the effectiveness of a variety of teaching media harmonized and co-ordinated to the end of giving a rounded comprehension of the subject. The necessity of using words with precision and economy is paramount here as it is in motion pictures and audio-visual technics where verbalism is prohibited.

No teaching medium ever devised has excited as much interest and discussion as motion pictures. It is the most glamorous of the visual aids and at the same time one of the most potentially important. It has captivated the imagination of teachers while arousing controversy between them over its merits. Films are rejected by some as being superficial and inefficient, and embraced by others as the answer to all teaching problems. Perhaps this wide variation of opinion is to be expected at this stage. At any rate it should not be regarded as a reflection on the medium itself but on our own lack of understanding of what films can and cannot do. The situation has been made more confusing by the indiscriminate use of teaching films by enthusiasts who have little knowledge of their limitations and by others who sometimes promote them for purely commercial reasons.

There is no doubt that the motion picture as a means of communicating knowledge has added a dynamic factor of genuine importance to visual instruction which some day is destined to play a more important role in medical education than it does at present. Twenty years ago, when I was associated with the production of a series of pioneer medical films, I had high hopes of the medium's rapid development. Looking back, I fail to see that we have accomplished much except to improve raw materials and provide better distribution methods. Generally speaking, our concepts of the nature, potentialities and limitations of the medium have advanced very little. It is obvious to those who have studied these things that the ultimate value of motion pictures and their place in technical medical education must rest on their unique ability to portray motion and give a vivid sense of reality to growth, development and change, and all dynamic processes of medicine which the eye cannot otherwise see. This ability to telescope and expand time and space finds its highest expression in revealing through animation or photomicrography such things as cell division, the life cycle of insect carriers of disease, behavior of leucocytes, and many other important phenomena and processes. This is the peculiar glory and primary function of films, unshared and undisputed by other visual aids. Within this sphere they can powerfully reinforce other media and contribute something of genuine importance which will deepen and make more responsive the student's understanding. Beyond this inner zone of its greatest value and effectiveness are other zones in which the motion picture can function in many ways. It can present in compact form a synoptic over-all view of a subject which serves to orient and to paint a background against which the student's more detailed studies take on added significance and meaning. It can make clear visual reports of new procedures and discoveries, and bring glimpses and impressions of much that is of interest from the outside world.

It is probably just as important to know the limitations of the motion picture as to know what it can accomplish. It can, for instance, supplement and reenforce all other media, but cannot replace any of them. It is basically a visualizing factor which can bridge the gap between our concept of the structure and form of an organ or part and our mental picture of its function and relations. It can give a sense of reality to performance which can often only be surmised according to the imagination of the individual. It is neither fair nor reasonable to expect motion pictures to do jobs for which they are not fitted. They are inherently a transitory medium which unfolds its story on the screen in a darkened room and is gone. It requires no effort or cooperation on the part of the student nor does it permit reflection or sustained study. However, when it is followed (or preceded) by other and more concrete material that can be examined and discussed, the message of the film can become consolidated into a more fully rounded concept of the subject.

The teacher of today has at his disposal a wider variety of tools than did his predecessors. The use which he makes of them will depend on his own knowledge of their characteristics and the extent of his experience and interest. There is no rule or law governing their application to a particular situation or task. There is, however, a principle which it will be helpful to remember. Words are by their nature one dimensional; pictures two dimensional and models three dimensional. Their integrated use leads to a form of four dimensional perception which is the highest form of understanding and the goal of all teaching.

It is the full realization of this goal, never to be lost sight of, that will guide us in the development of our teaching technics of the future. With a clear picture of the job to be done uppermost in mind, it is logical and altogether practical to select deliberately the medium or media best suited for the particular conditions. This is not always as easy as it sounds as these conditions have a wide range of variations and the technic employed will have to be adapted to the time allowed, capacity of students, and relation to other subjects, etc.

Again, the subjects to be taught vary greatly in their adaptability to visual technics. Anatomy, for instance, requires an 80 to 90 per cent visual ratio as compared to jurisprudence, which would rate very low. Here it should be pointed out that subjects hitherto thought to be outside the range of visual demonstration are now being made clear and interesting for the first time by graphic methods. One sees every day in newspapers and magazines, diagrams and cartoons depicting in simple and understandable fashion such things as the Bretton Woods agreement, tariffs, world politics and safety campaigns,—subjects which are vital but which have been difficult for the average man to comprehend via the written or spoken word. It may well be that knowledge of jurisprudence, medical ethics, theories and philosophies can, in a similar way, be greatly widened through the language of pictures.

It used to be common to hear the growing use of visual aids in public schools criticised as spoon feeding. Some argued that education was being made too easy and that the student, while being fed knowledge in a form which he could assimilate, was losing the precious art of reasoning and the ability to think,

which was held to be concomitant with conventional teaching methods. In medicine, some still fear that emphasis on the visual takes away from the student the benefits of hard work and mental discipline. They hold that he is not being taught to use wisely this more easily acquired knowledge. On the face of it these criticisms appear quite reasonable; however, there is no evidence so far that we need be alarmed. In fact, it is becoming clearer all the time that whatever virtue there is in trying to comprehend and visualize the physical world through wordy description and rote methods is more than offset by the more vivid concepts of his subject and keener interest which the student acquires through the visual pathways. This is not hard to understand. It is human nature at all stages of learning to develop interest and curiosity in proportion to the reality and concreteness of the subject. Consequently, the student, usually working against time, often finds the routine didactic paths he has to follow the worst kind of drudgery. He does his best and he forces himself to learn the answers, at least enough of them to pass his examinations, but he may have an aversion for the subject ever after.

Despite the awakened interest in visual instruction manifest in the whole field of medicine, many of our institutions lack minimum facilities for providing the graphic materials and services which they need to modernize their teaching technics. In some schools the need is recognized and efforts are being made to expand the budget to meet it. In others, the employment of a trained medical illustrator and photographer is regarded as a luxury which can be postponed till a later day. Experience has shown this to be dubious economy. Even the most modest unit or department, geared for the production, maintenance and general responsibility for visual materials, is worth all it costs. It can function in a surprising number of ways in addition to lightening the load of teacher and student.

The wider use of visual aids is in no sense a royal road to effective teaching. Collectively, these aids provide a modern, efficient and flexible vehicle which, in the hands of an intelligent driver, can reach its destination, quickly, comfortably and with more certainty than was possible by the older stereotyped methods. The driver, however, is important. He must know how to steer and operate the machine he controls and he must have a clear idea of his objective and the best routes by which it can be reached.

The machine is equally important. It must be designed, built and maintained by trained and experienced craftsmen. These people are the medical illustrators, photographers, makers of models, motion pictures and all the graphic materials of medical education. They have an important function which carries with it a responsibility greater than is generally realized. Are they conscious of this responsibility and are they prepared to meet it in the years which lie ahead? Perhaps, the answers can be found in a closer look at the situation as it exists today.

In America, at the present time, there are probably well over 1,000 persons professionally engaged in producing photographs, drawings, motion pictures, exhibits and other aids to the communication of medical knowledge. Fifty years

ago, I doubt if more than twenty-five such persons could have been found. It would be pleasant to record that this rapid numerical growth was accompanied by a corresponding development of ideas and concepts and a fuller appreciation of the relation of our work to medical education in the broad sense. I fear that this cannot be said. Individuals, here and there, have done outstanding work and a few, such as the great Max Broedel, have been a guide and inspiration to others in his particular field. We are producing a vast amount and a wide variety of visual aids and we have raised the general quality level of our handiwork. Our facilities are unexcelled and industrial science has given us wondrous tools to work with, such as color photography, audio-visual equipment, plastics, etc. The professional illustrators and medical photographers of our country outnumber by far those of any other nation. They have developed many clever technics and, as a group, they possess a high degree of technical competence. Yet, it would be difficult to point out where they have advanced the frontiers of visual education by any original contribution of a basic nature. During the last few decades Germany alone has made several such contributions. These are a new exhibit technic which made possible her great museums of health and hygiene; the analogy illustrations in Fritz Kahn's book, "Man in Structure and Function" and the development of plastic models such as the "Transparent Man" and "Transparent Woman."

Earlier in this paper, I alluded to the surface character of the progress which we have made in visual instruction. Our wider production and use of visual aids cannot conceal the fact that we do not yet completely understand their use or fully appreciate their significance to medical education. We have been intent on the quantity production of a product, the nature and potentialities of which we only partly comprehend. Perhaps, this is natural in a country as young as ours, but medical education is growing up and visual media and the art of their employment must grow with it.

Real progress demands two things, both important. One is an awakened interest in and greater knowledge on the part of the teachers of the mechanics of learning. The other and more urgent need is for better training and preption of the visual teaching media of medicine. No training of any kind is now available except in medical illustration, and the quality of this, however it may have sufficed in the past, no longer measures up to the higher standards and wider services now required and which will be required to an even greater degree in the future.

Much study and analysis of the situation has brought me to the conclusion that the best and most logical solution is to establish a teaching and research center where all visual communication of medical knowledge can be studied and developed and where a type of training can be provided which meets the demands of modern medical education in the widest sense.

I propose, therefore, an Institute of Visual Education where the visual arts, crafts and sciences of medical communication can be taught under ideal conditions, where thorough and comprehensive training would be provided on a solid foundation of basic medical knowledge, not only in medical illustration, but in

motion picture animation and production, exhibit design, scientific photography, museum and display technics, and the creation and production of models and all three dimensional media. (Fig. 2.)

An important function of the Institute would be to conduct research and promote tests and experiments in all forms of visual teaching technics. New media and materials would be studied and the results made available for general

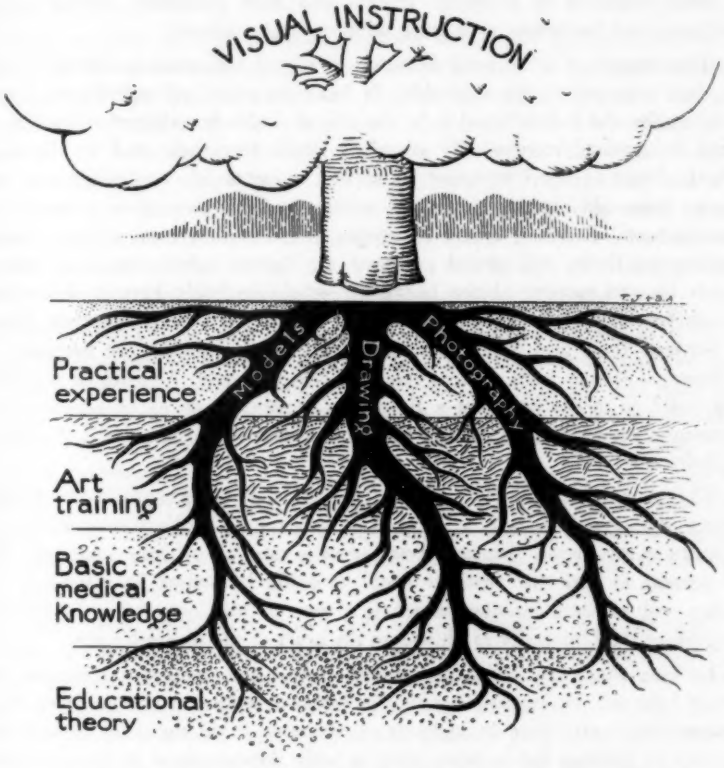

FIGURE 2.—The above symbolizes the author's concept of an ideal background which would meet the growing responsibilities of those engaged in the production of the visual media of medical education.

use. A wide variety of activities and studies could be carried on by staff and students which would be of ultimate value to the profession from top to bottom. An example of this would be the development of scientific motion picture animation which would open the door to the hidden world of function and dynamic processes of the human body and greatly extend the usefulness of films as a teaching medium in medicine. Attempts to do this in the past by amateur and commercial animators have all too clearly demonstrated the need for men especially trained for this work. It would also be the responsibility of the Institute

to provide much needed instruction in script writing and the general planning of motion pictures geared to medical education.

While the Institute would primarily be dedicated to comprehensive and coordinated training in the technical skills associated with visual aids and to research in these fields, it would have many incidental functions. As an example, it would serve as an advisory and information center to institutions and individuals in the field of medicine and public health. These and other services could also be made available to museums, journal and book publishers, motion picture producers and businesses concerned with medical products.

The concept of a National Institute of Visual Education in Medicine is in no sense visionary or impracticable. It has been examined and discussed from many angles and it is believed to be not only desirable but altogether feasible. It could be operated economically as only a small permanent staff would be required. Some of the instruction could be conducted by outstanding men and women from other institutions whose services could be secured on a visiting lectureship basis. Teaching would be further augmented by postgraduate students working on theses and special problems for degrees which would be offered. Funds for the support of the institution would probably have to come from foundations and gifts. A sum sufficient to provide an annual operating budget of between forty and fifty thousand dollars would probably be necessary, in addition to income from student fees and other services. Control of the Institute could be in the hands of a Board of Trustees made up of educators and representatives of leading medical institutions who would appoint a director or administrator.

The geographical location of the institute and its accessibility to a wide variety of materials as well as its relation to national medical associations, is a factor to be considered. Chicago would seem to meet all of these conditions. For the present at least the Institute could probably be housed in a wing of the library and museum building which is a part of the long range construction program of the University of Illinois in the heart of the medical center.

Looking ahead and projecting into the future the trend of the present, one cannot help but be impressed with the influence which the visual avenues of communication may have on methods of education in all the fields of medicine, not only in America but in other lands as well. Already some of these war torn countries, struggling to build a new and better civilization, are seeking our help to the end that they may learn more efficient technics of training which will provide, in a minimum of time, the armies of doctors, nurses and public health workers necessary to restore and protect the health and welfare of their people. Our war experience has shown that visual education is the greatest potential implement for the accomplishment of this task. Let us not repeat former mistakes by disguising old methods for application to the new and larger problems of today. The means at our disposal for making the teaching of medical subjects more easy to grasp, more thorough and less time consuming are a challenge to our imagination as we make plans to meet the immense educational problem which faces the world today.

Visual Education in Anatomy*

J. E. MARKEE
Professor and Head of the Department of Anatomy
Duke University School of Medicine
Durham, North Carolina

In our attempt to develop visual education in anatomy at Duke University School of Medicine, we found that we were very much in the same situation as the turtle. We, like he, could make progress only by sticking our neck out all the way. In short, we have developed a program for visual education in anatomy, and have used it through one year's instruction. The present report will be divided into several parts: (1) our aims; (2) the material and how it is used; (3) what we think we have accomplished; (4) the choice of the material and the limitations of the method; (5) plans for the use of these aids in instruction in anatomy in the clinical years, and finally, (6) the projection of five different types of motion pictures that we have made and used.

AIMS.—Our goal or aim in the use of visual aids in instruction is to increase the personalized type of teaching. Dr. F. H. Swett established the main features in our scheme of laboratory instruction,—that is, the full time participation of all seven of us in each of the laboratory courses. Since the scheduled laboratory time in anatomy is 550 hours, the students are supplied about 3,350 hours of instruction time in the laboratory, or about 47 instructional hours per student. These very high values should indicate the depth of our conviction that the most effective instruction is accomplished through contacts in the laboratories. Our desire to enhance and expand this type of teaching has motivated our use of visual aids.

VISUAL AIDS USED.—The visual aids used in anatomy at Duke might be summarized as follows: About 400 black and white lantern slides; about 1,000 35 mm. Kodachrome lantern slides; 30 models; 25 charts and about 15,000 feet of colored motion picture film. Black and white lantern slides, models and charts have been used extensively as visual aids in practically every anatomy department in the country. We have used them differently only in the sense of incorporating them into a program of visual education, the major part of which is Kodachrome slides and motion pictures. Since the extensive use of the latter constitutes the bulk of our program, I will discuss primarily our use of moving pictures in gross anatomy, and of Kodachrome stills in histology.

The approximately 12,000 foot gross anatomy cinema, which Dr. Hollinshead and I have prepared at Duke, is used for four quite different purposes: as a preview, as a detailed type of prosector demonstration and as a review for the medical students, and, in addition, for the instruction of nurses. To serve these four different purposes it was necessary to keep it flexible by not

* Read at the Fifty-sixth Annual Meeting of the Association of American Medical Colleges, held in Pittsburgh, October 29-31, 1945.

incorporating into it material that can and should be shown on lantern slides in some, but not in other, presentations. The fact that it is a silent picture makes it possible to alter the oral descriptions accompanying these various presentations. To keep this flexibility it is necessary that titles be used only at the beginning of a reel. However, the main reasons for the omission of titles and labels is that both waste the student's time, and it is pedagogically better that he hear the name and description of the structures at the same time that he sees them.

Many people have found that students learn little from a motion picture until they have an adequate background. We have found that it is necessary to supply the student with a synopsis listing all the structures in advance. A somewhat similar synopsis or outline is equally important for the full utilization of the Kodachrome lantern slides in the teaching of histology.

In both histology and gross anatomy, therefore, the student is shown in advance what he is going to see through the microscope or during his dissection. Thus, all of the significant structures are demonstrated to the entire class at once. We think this program possesses most of the advantages of, and in certain ways is superior to, a tutorial system.

Although a visual education program in anatomy at some other institution would undoubtedly be run differently, it may be of some value to present the specific program in use at Duke. By utilizing the entire staff in all of the anatomical teaching, the four subdivisions of anatomy have been so well integrated that the medical staff and students think and speak of anatomy rather than of gross anatomy, embryology, histology and neuroanatomy. However, it seems best to describe our presentation of each separately. In gross anatomy, the motion pictures and other visual aids are shown for a total of 36 hours, that is, during the first hour each Monday and Thursday for 18 weeks. In addition to the films showing what the students have just dissected and what they will dissect during the next three days, lantern slides of diagrams are used to present at least one organizational pattern onto which the student may hang the details. During the first hour on Saturdays, the students are shown lantern slides of x-ray films in an attempt to introduce them to the normal x-ray anatomy of the region they are dissecting. On other Saturdays, they see lantern slides and serial sections and animated cinemas demonstrating certain developmental processes. We feel that the incoming medical student should already have a knowledge of general mammalian embryology. Therefore, we do not give a course in early embryology, but instead stress those aspects of development which should help the student understand some of the abnormalities which he will encounter in clinical medicine.

On twelve afternoons during the semester, different members of the clinical staff present patients illustrating how anatomy is used in their respective specialties. Since correlation is possible only when the facts to be correlated are known, these presentations are carefully timed to coincide with the student's progress.

In histology, 35 mm. Kodachrome lantern slides are used very extensively. During the first 25 minutes of each laboratory period, slides illustrating the work for that period are shown. These colored transparencies are taken from the microscopic preparations in the student sets. For each histological preparation to be studied there is a lantern slide showing the entire section, and on it the general structure of the tissues and the location of points of interest are indicated. Other colored lantern slides show these structures at higher magnifications. Thus, the instructor shows to all students simultaneously the structures that can be seen with the naked eye and by the use of appropriate magnifications, and discusses the significance of these structures. Moving pictures of supravital preparations and of cells in tissue culture are shown both as a preview and as an amplification of the student's individual study of living preparations.

In neurology last year, the only visual aids used were lantern slides, models and projections of microscopic preparations of the central nervous system. This year, in place of the projection of individual sections, we expect to be able to use motion pictures showing in consecutive order the serial sections of a brain stem. In order that the student may gain some concept of the practical applications of neurology, one member of the anatomy department demonstrates approximately ten patients showing the effect of lesions in the part of the nervous system that the students are currently studying.

RESULTS ACHIEVED.—What one accomplishes through any teaching procedure is always difficult of measurement. If one believes that "teach" is always an intransitive verb, it becomes permissible to answer only the following question: In what ways do we think we have helped the students learn anatomy? Our answer would then be that we think that the student is given the equivalent of more individual help in his learning. All of the important structures are shown to the entire class, thus tending to prevent the otherwise inevitable hiatuses in student knowledge of anatomy. The demonstration of these structures before the laboratory periods enables the student to find them in less time. For example, in gross anatomy the student is able to dissect the bulky muscles more rapidly and, consequently, to divert the saved time to a more careful examination of certain important features of the trunk and head. This diversion of time from a clinically less important to a clinically more important region of the body would seem to be an ample justification of this program of visual education, even if it possessed no other advantages. Because the student wastes less time in fruitless search, and because he is better orientated, he accomplishes more. This sense of accomplishment increases his pleasureable interest and his motivation for more achievement, since it is well known that people really enjoy doing only those things they do well. All of the above factors, particularly the improved orientation, enables the students to learn more during a given number of hours spent studying the textbooks. In addition, for the first time at Duke, the entire class completed the entire dissection, and did so in time to have the last week free for review. In histology, we felt that their comprehension of

morphological detail was so improved that it was permissible this year to use a textbook in which the functional aspects of histology are particularly stressed.

In both gross and microscopic anatomy, the type of questions asked was more advanced and demonstrated more comprehension. We, therefore, found ourselves spending more time on correlation and integration in the instruction of individuals and groups.

CHOICE AND LIMITATIONS.—Our choice between 35 mm. Kodachromes and 16 mm. colored motion pictures has been governed by the following factors. The motion pictures can be used more advantageously to maintain the student's orientation throughout a sequence, to supply a complete series of illustrations in a scene in which some movement occurs, and to give an illusion of a third dimension as one part is moved over another. On the other hand, the 35 mm. Kodachrome is advantageous because of its lower cost and larger image. In addition, pictures taken on it can be presented in different sequences as the occasions demand.

The Kodachrome slides shown in histology should be taken from the microscopic preparations in the students' own sets. We believe that these transparencies are of value only as a preview of and an orientation to the material which the student must really study through his own microscope. We, therefore, feel that commercial transparencies can be of only a little more value than the illustrations already in his textbooks.

Even with the most careful choice of material, certain limitations of visual methods in instruction in anatomy are obvious. Whatever the visual aid used, it should fit into the total program for that particular course—it should not be just an entertaining side show. And unless the motion pictures are to be used only as a review, we feel the students should be supplied with a detailed synopsis. Further, the proper utilization of even the best aids involves a great deal of staff time, because the instructor showing them must be so completely familiar with the material that he knows all the details in the scenes and their order of sequence. A poor oral description often vitiates the value of a superior film. Finally, visual aids cannot be used to replace any of the laboratory work, or the study of the textbooks.

As a result of our attempt to present an integrated program employing methods of visual education, I feel that it is extremely urgent that the standards of acceptability of medical teaching films be re-evaluated. Many of the accredited motion pictures cannot be fitted into a program, are not well planned, and are extensively wasteful of student time. However, this problem is so broad that it can only be mentioned here.

EXPANSION OF OUR PROGRAM.—We plan to expand into the clinical years the teaching of anatomy by visual methods. As third year students begin work in each special clinical field, they should be shown films and other material reviewing for them the anatomy pertinent to that field. For the house staff there is planned a review of the anatomy concerned with each case presented at the

surgical staff conferences. Each year two residents in training should be assigned to the Anatomy Department to help present these reviews.

EXAMPLES OF DIFFERENT TYPES OF MOTION PICTURES.—Teaching motion pictures of various kinds can be used in visual education in anatomy, and I shall now mention five different types that we have produced and are now using in the Department of Anatomy at Duke. First, is the demonstration of a colored model. The model is rotated on a disc and then tilted so that all sides may be seen. The main advantage of the use of such a film over the use of the real model is magnification, the student in the rear of the class seeing an image eight feet in diameter instead of six inches. The advantage of the color cinema over a Kodachrome still is that of seeing the model from all sides, and an illusion of the third dimension. It may be well to point out that this is the cheapest type of film to produce, this one costing only about $4.00.

The second example is an animation of development of the aortic arches and of the embryological basis for the more common anomalies of the aortic arches. With the help of a student, I prepared this picture at Stanford University, partly as a hobby, at a total cost for materials of $23.50. The technique used is a marked simplification of that employed at the Disney Studios. If the drawings had been made by the artists in the Department of Medical Illustrations at Duke the cost of the artists' time would have been about $750.00. Produced by the Disney technique at Disney standards, its cost would be about $40,000.

The third example is about 1/40 of our motion picture of the dissection of the human body. The part shown is the dissection of the heart. The use of a number of magnifications and careful planning enables the student to maintain his orientation throughout the manipulation of the heart. The movement of the heart or its parts creates an illusion of the third dimension. The exclusion of all titles and labels has reduced the showing time to a minimum and has permitted a degree of continuity that could not otherwise have been attained. It has in addition maintained the flexibility that is necessary for the presentation of this film under four different sets of circumstances.

The fourth example is an action model that was manipulated as the film was taken. It demonstrates the formation of the layers of the scrotum during the descent of the testes, and the alterations in these layers produced by different types of inguinal hernia. In our program, it is used merely as a schematic illustration to enable the student to understand two other cinemas: one a dissection of the scrotum and its contents under normal conditions, and the other a dissection of the layers found in the scrotum of a body with an acquired oblique hernia.

The fifth example is one of my motion pictures showing all the serial sections of an embryo. Because the images of the successive sections are seen on the screen in rapid sequence, the student soon learns to interpret serial sections in three dimensions. I feel confident that our serial film of the human brain stem

will accomplish this end in neurology equally well. If it does, it will for the first time enable us to train a class of doctors who can locate lesions in the brain stem with reasonable facility.

SUMMARY

1. The visual education program used in the instruction in anatomy at the Duke University School of Medicine in 1944-45 is described and discussed.

2. This program was not and, it is believed cannot, be used to replace the use of the standard laboratory materials and textbooks.

3. The main advantage is better orientation of the student and, consequently, a saving of time in the laboratories and study halls. The time thus saved allowed a shifting of the schedule with a decrease in the time allotted to the material that was merely difficult and an increase in the time allotted to the material that is more important clinically. The more rapid learning of the basic facts also resulted in the students asking more advanced questions, and the diversion by the staff of more time to correlative and integrative discussion.

4. If such a program is to be used throughout the instruction in any course in a medical school, it is essential that it be entirely integrated within, at least, that course. If such a program is to be truly successful, most of the present motion pictures that are so wasteful of student time should be eliminated. This suggests the extreme urgency of a re-evaluation of medical teaching films.

The Use of Visual Aids in the Teaching of Medical Bacteriology*

HARRY E. MORTON
Associate Professor of Bacteriology
School of Medicine, University of Pennsylvania
Philadelphia, Pa.

The importance of visual aids is recognized by educators. The usefulness of visual aids in medical education was well demonstrated in the Armed Forces during the recent war. In the time allotted to me, I want to illustrate how two types of visual aids, motion picture films and lantern slides, may be used in the teaching of medical bacteriology.

Where a series of changes is involved, the motion picture film can best be employed. Ordinarily, students have no way of observing what happens in the interval between the inoculation of a culture medium one day and the observation of a fully grown culture the following day. Bacteriologists have at their disposal motion picture films made by elapsed time photography which show on the screen the growth of cultures in about 1/8000th the time required under actual conditions.[1] The method of reproduction of bacteria, yeasts and molds is different in each case. To the unaided eye these differences cannot be detected. The differences are very clearly shown when the growing cultures are observed by microphotography.[1]

Motion pictures may be used to slow down action which ordinarily is too rapid to see, such as a sneeze. This is the season of the year when the incidence of respiratory infections is on the increase and all of us become a little more conscious of people about us sneezing and coughing.

The subject of air-borne infection appears to be the most appropriate subject to represent the use of visual aids in the teaching of bacteriology. The motion picture film "The Sneeze" by Jennison[2] illustrates how motion may be slowed down on the screen. A few lantern slides from the collection of the Committee on Materials for Visual Instruction in Microbiology on the atomization of droplets into the air during sneezing, coughing and enunciation by Jennison,[3] illustrates the use of still pictures.

Sneezes vary considerably. We have slides showing the beginning of a sneeze (LS-2[4]); a violent, unstifled sneeze, not quite completed (LS-3); a violent, unstifled sneeze, completed (LS-5, Fig. 1); a sneeze by a person with a head cold (LS-6); a late stage of a stifled sneeze (LS-8).

To demonstrate that there are bacteria contained in sneezes all we have to do is direct a sneeze onto a culture dish (LS-17, Fig. 2). After incubation, a culture dish inoculated as in the previous picture, looks something like this (LS-18, Fig. 3). Each of the light spots is a bacterial colony resulting from the growth of the bacteria deposited by the sneeze.

* Presented at the Fifty-sixth Annual Meeting of the Association of American Medical Colleges, October 29-31, 1945, Pittsburgh, Pa.

What can an individual do to prevent the spread of his germs? One slide (LS-9) shows a sneeze stifled with the bare hand (some of the droplets get past the hand and into the atmosphere); a sneeze stifled with a handkerchief (LS-10, Fig. 4); fewer droplets are atomized into the air, as when the sneeze is stifled with the bare hand. Droplets are sprayed into the air from a cough (LS-11). Only a few droplets are produced in a cough as compared with the thousands produced in a sneeze.

The droplets produced in speaking are larger and fewer than those from sneezing (LS-12). This illustrates enunciating the letter F. Consonants are more difficult than vowels to pronounce without forming droplets.

Students frequently ask how effective are face masks in preventing the spread of air-borne infection. The answer to that depends on the construction of the face mask. Then there is a sneeze (LS-13) through a mask constructed of four thicknesses of muslin of 48 x 52 mesh; a sneeze (LS-16) through a face mask constructed of a layer of cotton flannel between two layers of muslin.

So much for how some visual aids may be used in teaching medical bacteriology. What have the bacteriologists done about visual education? At the beginning of the past war, the Society of American Bacteriologists appointed a Committee on Materials for Visual Instruction in Microbiology.[5] We examine and disseminate information on any motion picture film pertaining to the field of microbiology, immunology and public health which comes to our attention. We have examined and evaluated about 125 films to date. We also have about 135 still pictures for which we possess the negatives and from the negatives we are able to provide lantern slides of the standard size and the smaller variety, the 2 x 2 inch size. We are also able to furnish photographic prints in any conventional size from the negatives. Appropriate legends and explanatory remarks are furnished with all of our visual aids. We have a fair idea of what is available in our field. In the post war period when producers resume the making of teaching films for civilian use we hope to be able to serve in an advisory capacity in recommending subjects for which teaching films need to be made. Our Committee tries to serve as an agent by which the work of researchers will receive greater use in teaching and, at the same time, we hope that we are contributing something towards bettering the teaching of one of the basic medical sciences, bacteriology. In about two years' time nearly 200 educational institutions, and scientific organizations have availed themselves of services provided by our Committee.

REFERENCES

1. Wyckoff, R. W. G., and Lagadin, J. B.: The growth of bacteria, yeasts, and molds. 16 mm, 525 ft., black and white, silent film.

2. Jennison, M. W.: The sneeze. 16 mm, 100 ft., black and white, silent film.

3. Aerobiology. Edited by Forest Ray Moulton. Publication No. 17 of the American Association for the Advancement of Science, Smithsonian Institution Building, Washington, D. C. 1942. Pages 106-128 by Marshall W. Jennison.

Jennison, M. W.: The dynamics of sneezing—subjects by high speed photography. Scientific Monthly, 52, 24-33. 1941.

4. Lantern slides in the series which have been compiled by the Committee on Materials for Visual Instruction in Microbiology, Society of American Bacteriologists. The slides are available by rental or purchase to those interested in microbiology.

5. Present members: Harry E. Morton, Chairman; Richard Thompson, Denver, Colorado, and C. H. Workman, Ames, Iowa.

FIGURE 1.—A VIOLENT, UNSTIFLED SNEEZE, COMPLETED.

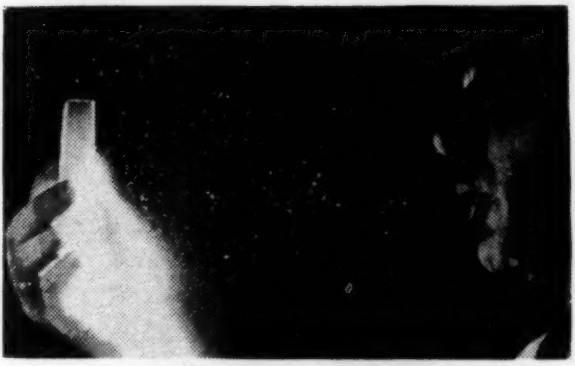

FIGURE 2.—SNEEZING ONTO A CULTURE DISH CONTAINING A NUTRIENT AGAR IN ORDER TO COLLECT THE BACTERIA IN THE DROPLETS WHICH ARE EXPELLED DURING SNEEZING.

These pictures are reproduced through the courtesy of Dr. Marshall W. Jennison, Massachusetts Institute of Technology, Department of Biology, Cambridge, Mass.

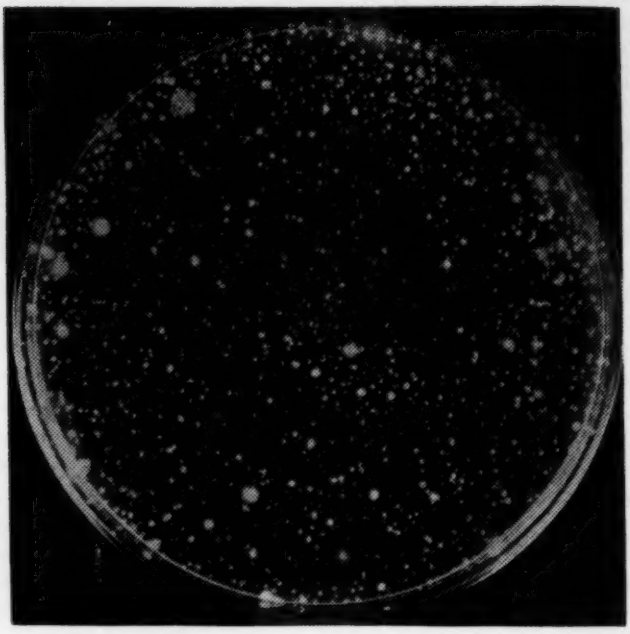

FIGURE 3.—COLONIES OF BACTERIA WHICH HAVE DEVELOPED DURING THE INCUBATION OF THE CULTURE PLATE INOCULATED WITH A SNEEZE AS SHOWN IN FIGURE 2.

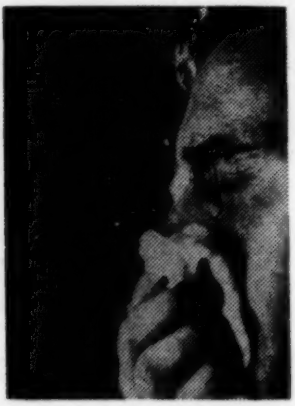

FIGURE 4.—A SNEEZE STIFLED WITH A HANDKERCHIEF. FEWER DROPLETS ARE ATOMIZED IN THE AIR BY TAKING SUCH PRECAUTIONS.

The Integration of Visual Education into the Medical School Curriculum*

LEWIS WATERS
Professor of Medical Art and Visual Education
Southwestern Medical College
Dallas, Texas

Visual-audio education now encompasses the largest number of subjects in the greatest variety of fields ever known to those of us who are interested in its application. This broader application has come about through its eligibility as a teaching medium and not because of any preconceived or firmly arranged plan, insofar as civilian use is concerned. This, then, should contribute to the knowledge that we are now in the beginning of an era when we must provide for an expanding use of this method of education, especially as it applies to the teaching of medical subjects. If its present valuable status has been reached without definite planning, the limits of employment should be increased if we begin to study methods for its better integration into the medical school curriculum.

During this transition period that is now following the most devastating of all wars, when many of the desirable practices developed during the period of acceleration will be continued in civilian pursuits, we must not lose sight of the fact that visual presentations have helped to prepare more men to do a particular job well in the shortest possible time than has ever been done before. That a lot of this training has been purely technical is readily admitted; nevertheless, the cleavage between technical training and education in its broadest sense is not as sharply defined as we may have thought in the past. It is now known that the rapidity with which native intelligence lends itself to the absorption of technical training indicates the capacity to acquire broader academic information.

In re-evaluation of all teaching methods as applied to medicine, the visual should be given the sincere consideration that it justly deserves. We must consider that although we led the world in training men to win a war, it perhaps could not have been won had it not been for the wide dispersal of medical knowledge to the armed forces. The isolated foot soldier, far removed from standard medical care, could render sufficient medical aid in emergencies to save countless lives by having seen visual demonstrations during his training period. We are now faced with peace, when dispersal of medical information will be as vital to the health of the world as it was to our armed forces.

The perfection of techniques of production has overbalanced the methods of application insofar as the total usefulness in medical teaching is concerned. The purpose of this presentation is not to stress any particular phase of visual instruction but to emphasize the importance of correct preparation and integration with other teaching methods.

* Read at the Fifty-sixth Annual Meeting of the Association of American Medical Colleges, held in Pittsburgh, October 29-31, 1945.

There are those who will tell you that the motion picture is the only form of visual education. To admit this would be the equivalent of saying that one drug or one method of treatment would cure all diseases. Under the general term of "visual education," I include all material in pictorial form which is used in teaching. Under the term, "visual-audio education," I place material which is seen and heard, as in motion pictures with synchronized sound or the amplified recordings of cardiac murmurs, which may be accompanied by films of the tracings of the electrocardiograph. There should be a thorough understanding of the educational possibilities of any visual project under consideration. Each method of presentation should be studied and adaptations made to allow for both academic and financial economy. I am certain that all schools would be interested in both approaches to this subject. Cheap production may produce a cheapness in use, while the most costly production would be economically sound if enough knowledge could be derived by applying it properly. The costliest production could also be impoverished from lack of information unless enough thought had been given to it even before beginning the technical work. Especially is this true of motion pictures. If they are not well planned, then the time of both teacher and student has been wasted. My abstinence from emphasizing any particular method of visual education is with the hope that all forms may be understood equally. We cannot deny that art as applied to medicine has helped immeasurably to disseminate information for years; neither should we deny some of the newer methods of presentation simply because a few talented and proficient individuals have been overworked for years in the production of drawings. We must accept photography in all its phases, on an equal basis with any other delineation processes. It is not so much the mixture of paints or the combination of emulsions as it is whether enough straight thinking has been used in the application of the various techniques.

Drawing has had a profound influence in medical education. So much so that many men in medical practice today refer to drawings in some standard textbook of anatomy or anatomical atlas as their refresher guide, before attempting surgical procedures. This serves to emphasize the fact that we remember what we see. It also demonstrates the necessity of having the presentation as accurate and revealing as is possible. It is also desirable to make the reproduction even more understandable than the original. This we do by accentuation, protraction, assimilation and magnification, when necessary. The result is a dependable medium not only for the immediate propagation of medical information but for its storage and future dissemination.

Some of the other modern techniques of visual presentation may have even a more profound influence on medical teaching than has drawing, in that a great many more subjects can be depicted quickly and adequately. All methods of visual-audio acquisition of knowledge should be made available to medical students and teachers as well as to postgraduate seekers of information. The availability is the prime necessity after the desirability has been established. For instance, it is recommended that all visual material should coincide with the subject exactly as it appears in the medical curriculum. If a film has been made on a

particular subject, a copy of that film should be owned by the school film library so that it could be shown without the necessity of a second or third choice, or the inconvenience of a tardy mail or express delivery if films are obtained from a distant source. It would be particularly advantageous for all schools to maintain and support a department given over to the production of all types of teaching material and incorporating a film library. This I know will not be acceptable immediately to some schools that have not enjoyed the advantages of a centralized department. Nevertheless, if the Department of Visual Education is maintained on an equal basis of usefulness with other departments, I believe it will more than compensate for any reasonable expenditure of funds in the satisfactory knowledge that a large part of the material for teaching is produced by and for the institution. It is assumed that the advantages of lantern slides, exhibits, drawings, charts and diagrams have been reasonably well established. At least, they have been in use much longer than other methods of visual expression, and, perhaps, not always given their just recognition as components of visual education.

Films of the 16 mm. variety are so new in technical perfection that we do not have sufficient criteria on which to base their utmost value in educational procedures. It is known, however, that for medical student use, few films have been prepared that would meet our present educational requirements. Most films have been made to demonstrate some special surgical techniques. In our school we tested the teaching value of these films. The best films available from every source in America were obtained. One hour per week was utilized for twenty-eight weeks, and thirty-two different subjects were presented to our senior class. Every attempt was made to correlate the film with other parts of the curriculum, although this could not always be accomplished because the schedule of films obtained from other sources had to be made up many months in advance. During the running of the film, the professor of surgery discussed the subject over a public address system synchronized with the projector, or occasionally when sound films were presented, no discourse was given. The remaining part of the hour was taken up with classroom discussions of the subject which had been shown.

This course was given to determine as accurately as possible how effectively films might be used in teaching. Quite a lot has been determined. Although all but two of the films had been approved by the American College of Surgeons, they simply did not completely fit the needs of undergraduate medical school teaching, in that they demonstrated too much technique, to the exclusion of other important and relevant information. The chief criticism was that although the films were technically good, the students were not given a sufficient background of why the patient needed an operation, what it was hoped to accomplish, and why a particular technique was employed. If they could have contained the history, examination, X-ray and blood picture, as well as the pathology of the illness, coupled with any other pertinent facts of the case, the teaching value would have been considerably enhanced. Although the films were not prepared for teaching undergraduate students, we feel that the time spent was well worth

while in that the average student retained 85 per cent of the information presented. The faults, therefore, were not in the medium of presentation but in the lack of information it contained. Other facts were established which bear out the following statements: The picture content must obviously and definitely be related to the subject, in a progressive manner. The content must be authentic and devoid of propaganda. If animation is used, facts should endure throughout. Cartoons may be amusing, but should be left to more relaxed moments. The level of appropriate information should match the level of maturity by classes. The information must be adaptable to the medium of presentation. Many films have been used when other media would have presented the subject more satisfactorily. The periods of excitement that have in the past accompanied the showing of films because of the disturbances of the glamour complex have passed, —they are now worth the time of presentation or they are worthless.

The facts established concerning films on surgery could be applied also to those on other medical subjects. While more surgical films have been produced, I feel that, on the average, the filming of other subjects has been planned more intelligently insofar as teaching value is concerned. Many films on preclinical subjects have been prepared intelligently and are being used, although not always to the best advantage. But they are well organized and we need more of them. We have in our film library copies of many of the most accepted films for teaching, together with several produced in our department. We have been using these for two years. We find that in preclinical work, those on the five basic sciences were most valuable, especially in presenting laboratory procedures. In the clinical applications, films on specific diseases, on taking histories, on special examinations and interpretations of results, give practical and stimulating information. As an example of an excellent teaching film, I mention "The Mechanism of the Heart Beat and Electrocardiography," by Louis Hurxtall et al. There is a great need for more films designed as this one has been, for the teaching of the subjects mentioned.

We must analyze a parallel between the production of visual material and its use in teaching. The production must be planned for teaching, expertly done and medically correct. The best material ever produced could be invalidated by the use of improper projection facilities or by the teacher's failure to use it most effectively. No visual materials, especially films, are advocated as a "spoon feeding" method. Too often students may feel that, "Here is a chance to catch that forty winks missed at last night's fraternity dance." This should not be true; neither should any material be used unless the instructor is entirely familiar with the contents presented and unless it fits the period in which it is used. The value derived from all visual presentation is in direct proportion to its intelligent use.

Whom may we expect to prepare all this material? We in our school have made a beginning in training people for this decidedly arduous though edifying task. The Department of Art and Visual Education is offering a curriculum for the specialized instruction of students that we feel must endure if we are to obtain talented people in this field of education. They must be prepared scholastically as well as technically for the production of these worthwhile sup-

plements to medical teaching. These students will come to us with the same educational requirements as if they were to study medicine, preferably with the A. B. or B. S. degree, with additional training in art and an understanding of its capacities. They will take several essential preclinical subjects, such as anatomy, histology, physiology and pathology in the regular medical classes, and at the same time take regular outlined courses in the preparation of drawings, photographs, photomicrographs, motion pictures and other products used in medical illustration. These courses of study will lead to the Master's Degree in Medical Illustration for those students who have gained their Bachelor's Degree.

We are not interested in training students in techniques of production alone, but rather in the application of their knowledge of medical subjects to adequate presentation in the most appropriate medium. We wish these individuals to be competent to fill places as visual specialists in the medical educational system. They will have had sufficient instruction in all forms of illustration, as well as in medical science and certain of its clinical applications to carry on this unique work with credit to themselves and their respective institutions.

Interested educators have thought for a long time that this type of training would be very desirable, especially since the preparation of visual material is now assuming mammoth proportions. It is pure fantasy to believe that we can derive the most advantage from visual application unless all problems of coordination are thoroughly understood by the producers and users of this material. Medicine, with its great heritage and greater future, deserves more than poorly prepared illustrators who are the products of short courses and inadequate study. Two organizations are now giving their whole attention to this subject. They are the Association of Medical Illustrators and the Biological Photographic Association. Both these organizations are doing a fine job in the study and improvement of visual presentation as an aid in teaching.

In the final analysis of this work, it seems appropriate that we should recognize the importance of this field of endeavor not only for its present usefulness but for its future possibilities of expansion and integration into the medical school curriculum, both in the training of personnel and improvement in excellence of production. We believe that there should be at least one person with extensive training in illustration and medical science on the faculty of every medical school. This person should head a department whose sole business would be the preparation and correlation of all medical visual material for teaching, research and extension programs. This, we will admit, would be a departure from accepted practice. It would, however, place all problems of visual medical application in the hands of those whose main talents, enthusiasm and interest are continually centered in this one subject.

While this presentation deals with medical school teaching, there are numerous applications in medicine and related fields where the value of visual education has long passed the experimental stage. In public health, in preventive medicine, in neuropsychiatry, in numerous other fields of advancing thought, vital pictures, through the precise clarity of comprehensive drawing or the con-

vincing reality of still or moving photographs, will tell the story. These pictures, however arranged, transcend the use of language to impart essential information on health and disease, or any scientific counterpart.

We are now facing a period of unparelleled medical scientific activity. A veritable flood of new advances have been, and are being made, covering therapeutic as well as preventive medicine. The knowledge of a great number of these advances has only been awaiting the return of peace for a wider and more immediate distribution. There is not a better aid in doing this quickly than by visual-audio means properly employed, saving thousands of hours for the student, the teacher and the postgraduate student physician. Cooperation among many divergent pursuits has gained a victory at arms. We must now apply this cooperation to medical education, in training individuals to gain a victory over the illnesses that affect the populations of the world.

A large per cent of all present visual medical material has been produced from outside the combined medical school faculties. If this material does not contain the information desired, it is because of faulty liaison between the mentor and the producer, and insufficient training on the part of the latter. To correct this, I suggest that insofar as visual application is concerned, the producer be trained more adequately in medical science and art, with an academic background equal to that of any other profession, and that he be a member of the medical school faculty, or occupied with other medical teaching. The most successful medical illustrators of our times have had wide and diversified medical training. That this came about more by chance than design on the part of medicine should not deter us from offering present students the proper academic incentive to become members of a new profession—"Medical Visual Information Specialists."

We might well consider the future of visual education in medicine in the light of recent inventions and general scientific developments. We may see the day, for instance, when television will carry views of medical and surgical procedures to any station in the school or hospital. Radar and electronics will be adapted to presenting new and at present little understood pictures of medical problems. We may see whole books on medical subjects somewhat dramatized and synoptically presented on the screen. Photographs taken with the aid of the electron microscope will become even more revealing.

The medical school that prepares now for the utilization of progressive visual education and the adaptation of related technical discoveries will find itself in the forefront of medical achievement. To see, to hear, to understand,—this is the essential triad that leads to ultimate wisdom.

Some Things We Have Learned About Medical Motion Pictures*

DEAN F. SMILEY, Commander, MC-(S), USNR.
In Charge, Audio-Visual Training Section
Professional Division, Bureau of Medicine and Surgery, U. S. Navy
Washington, D. C.

World War II brought to the Medical Department of the U. S. Navy an enormous teaching job which had to be done quickly and well. More than three million men taken from civilian life had to be trained in personal hygiene, first-aid procedures, survival techniques, defensive chemical warfare, and tropical disease prevention. More than 100 thousand men and women, for the most part devoid of medical training of any kind, had to be taught the essentials of care of the sick and wounded and given the confidence to carry on as hospital corpsmen. More than eleven thousand reservist physicians called from their peacetime practice of medicine had to somehow be prepared to meet their new responsibilities as Naval Medical Officers aboard ship or at advanced bases all over the world.

In meeting this teaching problem, training school programs, dock side training programs, and under way training programs were used; pamphlets, manuals, handbooks, posters, teaching charts and portfolios were provided in profusion; and approximately 150 training films were distributed. More than 100 of these training films were produced by the Navy itself, 40 being directed to the needs of enlisted men, 25 to the needs of hospital corpsmen and 40 or more to the needs of medical officers.

It is this latter group of films in which this organization is most interested and it is therefore to that group that I would direct my discussion.

PAINSTAKING PLANNING ESSENTIAL

The first and most important fact we have learned about medical training films is that painstaking planning is essential at every stage of production. The production of a good training film is comparable to the building of a house, and at every stage architectural and structural planning must precede building. There must be planning to assure scientific accuracy: through selection of a well qualified technical adviser; through discussion of controversial issues with experts in the field in order to obtain a consensus of opinion; through close cooperation of the technical adviser and writer in the preparation of the script; through having the technical adviser present at the shooting of all footage and at the recording of the narration; and finally through critical review by a committee of experts at rough cut, interlock and composite stages.

Planning to assure good teaching techniques will include: proper gradation from the known to the unknown, from the simple to the complex; emphasis on

*Read at the Fifty-sixth Annual Meeting of the Association of American Medical Colleges, held in Pittsburgh, October 29-31, 1945.

the correct and positive rather than on the incorrect or negative; increased intensity of educational stimulus to compensate for shortened duration of stimulus (average training film not over 30 minutes in length, preferably not over 20 minutes); careful choice of vocabulary; extremely careful sentence structure.

Planning to assure audience interest involves: relating the film's subject matter as quickly and directly as possible to the needs or duties of the audience; avoidance of boredom by "telescoping" action and time; inclusion of attractive general interest material; the use of long shots, medium shots and close-ups as well as a variety of camera angles in order to lend optical interest; the proper use of music; the unobtrusive use in selected instances of a dramatic framework or story form; a sufficiently rapid change of scene to maintain a pleasing pace.

The necessity of such planning is so obvious and the advantages so apparent, that it is hard to see how we can any longer justify the physician who wastes time, effort and film in "shooting off the cuff." He puts himself very much in the same position as the "jack-knife carpenter" building a house without benefit of blue print or plan.

A VARIETY OF PROFESSIONAL SKILLS NECESSARY

Another fact which we physicians have been somewhat slow to appreciate is that making a medical training film is not a one-man job, but requires a variety of professional skills at each stage of production. At the script stage we need the technical knowledge and skill of the technical adviser, the writing and dramatic skill of the writer, the production-planning skill of the project supervisor. At the shooting stage we must add the skill of the camera director and that of the medical photographer and, perhaps, that of the professional actor and that of the animation artist. At the cutting stage two more technical skills become essential, i. e., that of the film cutter and editor and that of the optical effects specialist. And when we come finally to recording the narration we must call in the narrator and the sound recording engineers.

To return again to the simile of building a house, you can get a local handy man to build a summer camp for you and that one handy man can be architect, engineer, carpenter, mason, plumber, electrician and interior decorator combined, but I doubt if you would want to see your city residence built that way!

A SPECIFIC TARGET FOR EACH FILM

It is obvious that training films for enlisted men must be quite different from those for hospital corpsmen and these, in turn, different from films for medical officers. It is not so obvious, however, that training films all at the professional level, must be differentiated still further. Such we found to be the case and we have come to feel that it is quite important to determine at the very beginning of a plastic surgery film, for example, whether the film is to be directed to all medical officers, to all surgeons, or to plastic surgeons only. In some instances, too, it is important to make an early decision as to whether the film is to impart general information with regard to a subject or whether it is to be a real "nuts and bolts" training film carrying detailed instructions or techniques.

Ofttimes a detailed training film for a specialized group can be cut into a shorter informational film for a less specialized medical group, but in our experience adaptation of such training films for the general medical group has almost always necessitated a complete remaking of the picture, usually using only a portion of the original footage and making many inserts.

Judging by our experience it would be quite unwise to expect doctors in practice to be pleased with medical training films directed to medical students. It is quite possible, however, that films directed to physicians in practice might be reasonably acceptable to medical students.

CERTAIN FLELDS PARTICULARLY SUITED

While all fields of medical training would appear to be approachable through the medium of the film there are some fields that offer especially attractive possibilities. Fields involving manual skills, such as surgery and dentistry provide remarkable opportunities for demonstrating techniques and eventual results of those techniques. Epidemiology, involving as it does environmental and social problems as well as medical problems, gives ample opportunity to the film to portray, for example, photomicrographs of the causative agent, close-ups of the animal hosts and insect hosts in their natural habitat, typical home or working conditions which predispose to spread of the infection, the clinical appearance of the disease in its chief forms or varieties, and, finally, the important preventive measures as actually applied.

The usefulness of films in the group treatment of combat fatigue cases deserves mention. The neuropsychiatrists have quite definitely shown the value of films in demonstrating to these patients in groups the mechanism underlying their symptoms and how with the help of the doctor these symptoms can frequently be relieved.

A MONTHLY MEDICAL REPORT FILM A POSSIBILITY

Quite early in the war, the need became evident for some form of release which would bring to the whole medical department any new medical advance made anywhere. To meet this need, the Medicine in Action Series was set up and three Naval Field Medical Photographic Units were sent out to obtain the necessary footage. Each unit consisted of 1 physician, 2 medical photographers and 1 assistant. From the footage sent in by these units were made the following 400 foot monthly releases: Pacific Enemy No. 2—Malaria, Typhus in Naples, Breakbone Fever—Dengue, Soft Tissue Wounds, DDT, Trench Foot, Evacuation of Casualties—Saipan, Head Injury—Report of a Battle Casualty, Multiple Wounds. Still to be released are films on Cholera in India, The Work of Epidemiology Unit No. 50, Schistosomiasis in Egypt.

These report films leave much to be desired, but they met a real need during the war. It is an interesting speculation as to what such a March of Time series would contribute if it could be produced in peacetime and distributed each month to every medical school and County Medical Society in the country. I am willing to guess that it would increase the interest and morale of medical

students, improve attendance at County Medical Society meetings, and contribute measurably to keeping the practicing physicians abreast of the times. If 2,400 subscribers could be found who would contribute $60 a piece per year, such a service could be provided and maintained.

SOUND FILMS GENERALLY PREFERABLE

Many medical teachers prefer the silent film to the sound film. They inherently dislike the idea of a "canned lecture" and they prefer to narrate and explain the picture as it unrolls, stopping the film where questions arise.

If all silent medical films were to be used that way, that would, perhaps, be the ideal situation. It has been the experience of the Navy, however, that too few instructors are familiar enough with the films to narrate and explain them adequately. As the result, the silent film has to depend largely on its titles for its accompanying explanation. Silent films thus used are at a disadvantage to sound films in these respects: the titles slow the pace to that of the slowest readers (and therefore bore many); the explanation comes before the picture, not with it, and the enhancement in "hitting power" which the sound stimulus should give the visual stimulus is missing.

In view of these disadvantages of unnarrated silent films and of the fact that the sound film can easily be run silent when the instructor wishes to narrate, it would appear that the movement might well be toward sound films.

DISTRIBUTION AND UTILIZATION MUST FOLLOW PRODUCTION

One might easily assume that if good practical training films for medical men were available, physicians in hospitals and other medical centers would almost automatically seek them out and use them. Such, however, has not been the experience of the Navy.

In the rush of the week's work in the average hospital there is often no hour of the week when all the doctors can free themselves of their work and congregate to view films. An evening hour finds many of them at their homes, perhaps, miles distant from the hospital. A film is not something you can arrange to see on the spur of the moment or pick up like a book to fill a spare moment; often it can be shown but once at a designated time and place and then it must be returned. The answer to this problem is not an easy one but at least two fairly satisfactory solutions have been found in different hospitals, i. e., one, to show a selected film at each staff meeting, thus making it a "command performance" and in working hours; two, to have a regularly scheduled film program at a set hour each week. If this latter plan is to succeed it has been found generally necessary to take the following steps: (1) have a training aids officer appointed and responsible for organizing and announcing the showing; (2) mimeographed announcement of the showing with a brief description of the films to be shown, sent to each doctor each week; (3) film programs carefully planned to balance surgical films with medical films and to include in each program one general interest, news reel, or war orientation film; (4) each film briefly introduced and some suggestions made as to what to look for.

CONCLUSIONS

In summary, we have learned as the result of our experience in producing more than 40 medical training films at the professional level:

1. That painstaking planning is essential.
2. That a variety of professional skills is necessary at every stage of production.
3. That each film must have a very definite and specific target.
4. That many subjects in the fields of surgery, dentistry, epidemiology and neuropsychiatry lend themselves particularly well to motion-picture treatment.
5. That a monthly medical report film is a practical possibility.
6. That sound films are generally preferable to silent films.
7. That distribution and utilization must be given the same kind of attention as is given production.

DISCUSSION ON SYMPOSIUM ON VISUAL EDUCATION

DR. W. W. PETER (Arlington, Va.): Before I present a summary of a survey on the use of motion pictures in teaching one particular subject of the curriculum, public health, in medical schools of the United States and Canada, may I discharge another obligation? There are many people in this room to whom the Institute of Inter-American Affairs is indebted. To you and to your associates the Institute voices its appreciation. In 1943, the Institute of Inter-American Affairs began a five year program to help train physicians and others from eighteen South American countries. Already more than four hundred have received such professional training in this country. Since I became Director of Training Division in June, 1945, I must say that whatever success may attend the training program of the Institute of Inter-American Affairs is due in large part to the men in this room and to their colleagues all over the country. On behalf of the Institute of Inter-American Affairs I think this is a good opportunity to say—Thank you, gentlemen.

In teaching public health in medical schools, does the use of motion picture films save time, waste time, or just afford a good time? How useful are they? In how many medical schools are they used? Is such use increasing or decreasing? What is needed to make the use of films more effective?

The Conference of Professors of Public Health appointed a committee some time ago to conduct a survey of the medical schools in the United States and Canada to secure answers to various questions related to this subject. I shall limit my report on this occasion to replies from the four year schools,—70 in the United States and 9 in Canada. Lack of time necessitates excluding reports from the two year schools,—8 in the United States and 1 in Canada. Generally, public health is not taught during the first two years of the medical course.

Question 1. "Have you made use of motion pictures on public health and related subjects?"

From United States schools, there were 67 replies. The answers were: 46 "yes" and 13 "no." Schools reporting the number of years they have been using motion pictures were as follows: In 24, from 1 to 5 years; in 13, from 6 to 10; in 3, for more than 10 years. These three are: Cincinnati, 19; University of Iowa, 14, and Medical College of Virginia, 12. In Canada, 4 schools were using films and 4 were non-users.

Question 2. "Name some of the titles or subjects you selected."

Fifty-six titles were listed. Users in the United States and Canada mentioned malaria 21 and 2 times, respectively; venereal diseases 24 and 3 times; water treatment 12; sewage 10; tuberculosis 9; communicable diseases 5. Others were industrial hygiene, rodent control and milk. Altogether 56 different titles were reported from the United States; from Canada 9.

Question 3. "What subjects lent themselves to moving picture presentation?"

Thirty-four replies were received. In the United States, 31 subjects were included. Venereal diseases and malaria were mentioned 15 times each. Sewage and water treatment, 8 times. Also, nutrition, spotted fever, communicable diseases, industrial hygiene and tuberculosis. Important, also, are subjects not suitable for motion picture presentation, such as technical procedures, physical administration, vital statistics, rheumatic fever, school health and laboratory techniques.

Question 4. "How many titles were used in the course of one year?"

In the United States, 42 replied: 1 to 5 titles, 22 schools; 6 to 10 titles, 12 schools; 11 to 15 titles, 4 schools; 16 to 25 titles, 2 schools; 36 to 50 titles, 2 schools. In Canada, 3 replied: 1 title 1 school; 6 to 10 titles, 1 school; 11 to 15 titles, 1 school. Very few schools used more than 10 titles a year. Technical films were preferred for use with medical students rather than popular health films.

Question 5. "Where did you get the films used?"

Thirty-two schools replied in detail. Forty-one different sources were mentioned; some of them more than once. For example, the United States Public Health Service was mentioned 16 times. Nineteen state boards of health were also listed; the Tennessee Valley Authority, 8 times; pharmaceutical houses, 12 times; 10 professors of public health made their own films.

Question 6. "Do you intend to increase or decrease your use of public health teaching films?"

Of 46 replies from the United States, 1 school intends to decrease the number, but increase the quality; 2 schools are uncertain; 9 will make no change and 34 will increase. Of 4 replies from Canadian users, 4 will increase their use of films.

Question 7. "To avoid individual trial and error and to save time and money, should there be a central clearing house to which professors of public health can go for advice on available titles, names of distributors, rental costs, quality of presentation, etc., for planning their local film teaching program?"

Forty-six United States and three Canadian schools said "yes." The Laval School in Quebec said, "Perhaps, for bilingual reasons, each medical school should make its own films." Not one school said "no."

CONCLUSION

There is a unanimous desire in the medical schools in the United States and Canada for more and better films for teaching public health. Also, for a central agency to provide lists of available films with descriptions of the gauge, color, silent or sound, length and subject matter. Finally where there is a very strongly expressed desire for competent appraisal of the quality of films, it is to be hoped that some agency blessed with funds and personnel will undertake to render this important service.

It may be that some of the problems connected with the use of motion picture films in medical schools will be solved by the Committee on Medical Motion Pictures recently appointed by the Board of Trustees of the American Medical Association.

DR. R. P. WALTON (Medical College of South Carolina): I particularly appreciate the opportunity to follow up what Dr. Peter said about the idea of centralization of information in this subject. We have been charged with operating under a chaos of decentralization. That is partly true. Some very excellent films have been made by

people not necessarily known to be making films, not commercial companies. Individual teachers, such as Dr. Markee and quite a number of others, have been making film especially valuable in teaching, which can be used by other departments which are teaching in about the same way.

It is very difficult to know what is available in these lines. We have some pretty good examples of what can be done in that direction. I refer particularly to what Dr. Morton has done in working as a committee chairman with the bacteriologists. They supply information up-to-date,—regular,—frequent, giving good critical analyses of the content of these films, a critical analysis from our standpoint, particularly directed toward the idea of adaptability to teaching. The anatomists do something of the same sort through the Wistar institute. Their publication in the *Anatomical Record* gives an excellent critical analysis. The American College of Surgeons lists about 900 titles renewed every year, but that does not give the critical analyses. So far as I know, none of the other preclinical or clinical groups give the sort of information which is available to the bacteriology group and to the anatomists.

This sort of thing is available in other fields. The Educational Film Catalog published by H. W. Wilson Company is up to date and extremely valuable in the field of general education. They corresponded and wanted to know what they should do about their medical section, which was rather incomplete, and the only answer I could give was not to attempt to do anything in this direction in the medical field until it is taken over by some medical group. It is a question whether the American Medical Association will take it over or some group initiated from this Association, or, say, from the Encyclopedia Britannica, which has a considerable subsidy and is now working through the University of Chicago, with expectation of greatly broadening the field of visual education. Which organization is going to do it is a question, but I think it is the most vital thing necessary here,—a coordinated book such as the Educational Film Catalog, in the field of general education.

One other comment or two about methods or technics we might anticipate in the future. I think it is interesting the way the photographic technics are adapted to the different sciences, for instance, time lapse photography to bacteriology. I have been interested in making films such as Dr. Markee has made, only in this case in pharmacology, and the thing that showed up particularly was the opportunity of masking and showing in one part of the field a normal organ,—the open abdomen, showing the gut movements, or the open chest, or isolated heart, showing heart movements, normal in one part of the field, and the other part of the field showing the drug affected organ; in other words, that device of masking is particularly and uniquely suited to pharmacology where we are interested in, first, the normal and then the normal as affected by drugs. We can show those two directly on the screen at the same time, and it is a rather useful technic.

When anticipating other things to come, we might mention stereoscopic movies, for instance. That is, at present, rather complicated. The Services have used some of that. It gives you the effect of depth when studying plane recognition and so forth. That would have a particular use with demonstrations of cardiac movements; ventricular fibrillation would be better recognized if we had depth in the picture. Of course, as Dr. Markee has used it here, he has practically achieved the aspect of depth by moving the organs as they are photographed.

One very humble development which is proving exceptionally practical in other educational fields is the use of film strip with a correlated phonograph disk which simply signals with a buzzer when each new frame is to be projected. This can be produced at minimal costs and is capable of presenting much of the material which is frequently included in sound films since a considerable fraction of material now appearing in sound films is not strictly dynamic in character. It has been suggested in my field of pharmacology that we have a series of lectures prepared by those most experienced in

each of the different fields and put these on sound film for purposes of distribution. This gives a "canned" lecture, but brought up to date every year and giving something of the aspects of a seminar report. There are undoubtedly some desirable features in such a plan. The idea, however, of executing this on sound film is hardly feasible. The Navy has given a figure of a thousand dollars per minute of screen time. This cost can be reduced considerably under other circumstances but the cost of very much sound film is well beyond most preclinical budgets.

With film strip and a correlated phonograph disk a canned lecture can be produced at a relatively trivial cost. There are enough advantages here that the idea merits consideration. The low cost makes possible frequent revision and, also, easy distribution can facilitate the collection of suggestions and criticisms from other groups. A "canned" lecture does not have to mean an "embalmed" lecture but rather the opposite. It does not have to mean wholly mechanized teaching. A mechanically reproduced lecture that runs for 30 minutes and is followed by thirty minutes more of intimate discussion with the student as to what he saw and thought about it I believe has more personal contact than the one hour formal lecture as commonly given.

And another feature, America being in a position of dominance at the present time in the field of medicine, is obligated to furnish the rest of the world with the better developments in teaching methods which we have available. There is no better medium for that than the movie film or the much more economical film strip and phonograph record. I feel that in the next year the phonograph record can be replaced by the magnetized wire arrangement, which is technically an improvement, but still just about as cheap to operate and produce.

Dr. A. J. Carlson (University of Chicago): Don't put all the canned lectures on the records. There are too many of them that don't deserve it, and yet they are being given in our medical schools. I think we should have a little clarity of thinking as to visual education. Anatomy has been visual education. Physiology—when we begin laboratory demonstrations, is visual education. We have been discussing here additional factors amplifying the visual education that exists in most of the subjects in the medical school. That is it, and not the whole subject of visual education. In the United States, anatomy and physiology, biochemistry and pharmacology, have been visual education for the last fifty years.

I should like to have you answer a question, Dr. Markee, as to what values certain types of additional visual education may have. Very few of you in your training in the medical school actually saw the workings of the valves of the heart. You had your anatomy, you had the dynamics of circulation but seeing the workings of the valves of the heart—you didn't! How many of you saw the rhythmical workings of the villi of the intestines? Hold up your hands. Not a hand full! I didn't see them for forty years.

We have the anatomy; we have the descriptions in the textbooks how they work, and consequently the intellectual conception of the workings of the valves of the heart and the villi of the intestines. But they are hard to demonstrate. It can be done, and I did get them on the motion film, both the heart valves and the intestinal villi. What did this add to my understanding of either? I don't know. I think they fixed the memory of something, but certainly they added nothing to my intellectual conception of their function, but something that fixes the memory more clearly may be of value. In all these discussions I have listened to this morning with considerable profit, hadn't we better consult the teacher a little as to the production of all this stuff? Hadn't we better consult the real teacher, in addition to these various experts? I think that would be valuable in the further developments.

Dr. J. E. Markee: As Dr. Carlson has said, the most effective visual educational method is a demonstration for each individual student. In the teaching of anatomy, we

supply the class with about 3,850 hours of individual laboratory instruction and devote only approximately 60 hours to the use of visual aids before the entire class. Consequently, we want the smaller part of the program to fit into the major part.

We agree with Dr. Carlson that the presentation by means of motion pictures of material that is interesting, but not an integral part of a teaching program, is of questionable value. I think we should discard the sideshows, interesting though they may be. Instead, we should use only those visual aids that help a student master the subject in a minimum amount of time.

The difference in the cost of silent and sound motion pictures is of practical importance to those of us who produce our own. The sound equipment is more expensive and the sound film costs more per foot and 50 per cent more film is required per minute of showing time. In addition, since the silent films should be projected at sixteen frames a second, and the sound films at twenty-four frames, the latter wear out much faster.

DR. GEORGE H. MILLER (American College of Surgeons): I was interested in what has just been said by Dr. Carlson about the preparation of films. It falls in line with the program of the College of Surgeons now getting under way for the making of teaching films for the surgical specialties. A good many years ago—I believe it was soon after 1925—the College of Surgeons started to develop a program somewhat of this type with the support of Mr. George Eastman of the Eastman Kodak Company and Mr. Will Hays of the motion picture producers. A few films at that time were prepared under the direction and constant supervision of leaders in the educational fields involved. Due to the death of Mr. Eastman soon after this was undertaken only a few films were completed.

Since that time the College's department of motion pictures has carried on an interim program. This has consisted in the reviewing of films on medical, surgical and allied subjects submitted for approval by numerous producers and owners. Specialists in the field with which each film deals are appointed to sit on the reviewing committee for that film. Films which meet the College's basic standards in professional technique, teaching value and photographic quality are approved and the inclusion in the film of a legend indicating approval is authorized. Lists of approved films have been published in the annual approval number of the College Bulletin for the information of the medical profession. These lists give a brief description of the film and indicate its ownership and availability for teaching use.

There has been evidence at times of some tendency toward duplication of effort in films presented for review and approval. Because of this and realizing, as has been stressed by practically all speakers today, that there is need for teaching films of higher quality which have been carefully planned and produced to fill real teaching needs, the American College of Surgeons has recently initiated a new program of producing teaching films for general surgery and the surgical specialties.

In order to obtain the necessary professional consultation and guidance, an advisory committee of teachers in each specialty has been appointed to assist in determining the films most urgently needed for teaching purposes and to select the member of the professional specialty best qualified to make each film. It is intended that each series shall deal with the applied basic sciences as well as with the clinical aspects of each subject undertaken. When the subjects and authors have been chosen with the assistance of the advisory committees, the College will secure the best technical assistance and, with the authors will supervise the preparation of scenarios and the details of producing and editing the films. A long range program of five or ten years' work is being planned.

Medical Science at War*

A. A. WEECH
Professor of Pediatrics, University of Cincinnati College of Medicine
Cincinnati, Ohio

During the past several years the circumstance of war has brought to me the privilege of association with a widely scattered group of physicians, teachers and investigators in the fields of basic medical science and others whose special experience and training have developed the qualifications for group participation. These men have been endeavoring to promote medical research where research is most needed and to see that the fruits of research achieve without delay their objective of being applied to the prevention and treatment of disease and the management of battle wounds. My hat is off to some of these men who voluntarily abandoned their peace time occupations in order to devote their entire energy to the national cause. No contribution which I have made deserves even middle page mention in the newspaper annals of medical science at war. I am merely grateful to have had the opportunity to view from within the working of a great machine. As an investigator engaged in research under government contract, as a member of one of the subcommittees of the National Research Council and as a consultant in a narrow field to the Committee on Medical Research, I have at least had a diversified opportunity to watch the wheels go round. And, having reached a state of maturity which may not be far removed from senility, I have permitted philosophical cogitations to wander through the mind while observing the turning wheels. This evening I have chosen to talk a bit about the cogitations. They deal with past and present work in the field of medical science and with certain implications for the future. They are, perhaps, appropriate for an occasion staged at the postprandial hour which society has decreed should be devoted to congeniality and philosophical discussion.

With some hesitancy, I shall begin by asserting that at no time in the history of the human race has any large body of people had access to a quality of medical and surgical care superior to that which has been made available to our Armed Forces. I hesitate in the assertion because bragging breeds complacency and complacency dooms progress. But, I think the assertion is true. Indeed, I think no one will challenge the truth of the assertion. If it is true, the proposition possesses an inescapable corollary. There must have been much that is good in the American system of medical education and practice, in American public health administrations and in the organization and setting of philanthropical, educational and commercial institutions which fostered medical research. It behooves us to take heed that the features of proven merit are not lost in the eternal struggle to improve. Nor must we be ensnared by assuming that what was good was best. The record of American medicine at war is good and it deserves high praise. That it might have been even better, should be admitted frankly. That it shall be better in peace or war, must be our determination.

* Address delivered to the members of Pi Kappa Epsilon, University of Cincinnati College of Medicine, May 2, 1946.

The accomplishments of American medicine stem primarily from the medical schools. There are 71 medical schools in the United States. There are seven additional schools which limit themselves to teaching the basic medical sciences. All these schools maintain laboratories and a teaching staff for instruction in anatomy, physiology, biochemistry, pharamcology, pathology and bacteriology. In nearly all of the laboratories someone engages in fundamental research. In most of the schools the clinical departments likewise possess research facilities. In some schools these facilities are highly developed. For, the concept is firmly entrenched that the dissemination of knowledge is most effective when the teaching is done by men experienced in the discipline of creating knowledge. The marriage of pedagogy and research has done more than promote sound teaching; it has resulted in an amazing expansion in the sum total of medical knowledge. This feature of medical education must not be endangered. Indeed, far greater resources are needed for cultivation of a concept of proved value. In most medical schools the concept is still a bud which, because of lack of funds, has not been permitted to flower into full maturity.

The system had, however, before the war led to advances in medical science to which we can point with pride. My brief medical career has embraced the discovery of insulin as well as active hormones from the pituitary, parathyroid, adrenal and male and female sex glands. It has encompassed the recognition of a long list of vitamins. It has included discovery of the anti-anemic factors in liver. It has witnessed the introduction of effective means of preventing diphtheria and of a therapeutic agent for treating influenzal meningitis. It was crowned before the war by swiftly expanding applications for a list of magic medicines which already were being spoken of in familiar and affectionate terms as the "sulfa drugs." This body of knowledge was available when the nation went to war. The knowledge and the men who applied the knowledge have made an enviable military record. Dysentery and the spread of dysentery are better managed than in any previous war. Typhoid fever and cholera have been practically eliminated. The case fatality in lobar pneumonia has been reduced from 24 per cent in World War I to 1 per cent in World War II. Meningitis is less prevalent than in World War I and the case fatality has been reduced by almost seven-eighths. These are but a few of the military triumphs of therapeutic and hygienic developments.

The archives of military medicine will do more than record the application of available knowledge to the needs of Army and Navy. They will also tell a brilliant story of the creation of new knowledge and of the crystallization of inadequate knowledge under the pressure of emergency need. "Penicillin" and "DDT" are magic words which were completely unfamiliar before the war. Infections due to staphylococcus, streptococcus, pneumococcus, gonococcus, Treponema pallidum, meningococcus, anthrax and others yield in an amazing way to treatment with penicillin. The epidemiology of diseases borne by flies, mosquitoes and other insects is being profoundly affected by the development of DDT. The lethal action of this agent on the lowly cootie was responsible for the spectacular control of an epidemic of typhus fever at Naples. There are many more examples.

A feeling of pride in the home team compels me to mention the development of preservative solutions which have made whole blood transfusions practical in any region of the world. Because of these solutions, blood can be collected in the United States, delivered to any of the far flung fighting theaters and kept there long enough to be of service when the hour of need arrives. These developments, of which we can justly be proud, are largely the result of measures taken to gear the scientific facilities and the scientific manpower of the country into an integrated and smoothly functioning machine.

During the summer of 1940, the Surgeons General of the United States requested the Division of Medical Sciences of the National Research Council to act in an advisory capacity to them and to their offices. The request was accepted and ultimately led to the formation by the NRC of 13 committees and 43 subcommittees with a combined membership of 354 individuals. There was a committee on infectious disease, a committee on nutrition, a committee on the suddenly important subject of tropical disease, etc. I shall not give the entire list. Each committee was mobilized from highly trained and skilled experts in the civilian population. Most commonly the experts were teachers and university professors trained in experimental disciplines. In June, 1941, the Committee on Medical Research was organized as a division of the Office of Scientific Research and Development. The operations of this organization were integrated closely with those of the National Research Council. Both CMR and NRC have their offices in the same building on Constitution Avenue in Washington. Outsiders are usually confused concerning the respective responsibilities and activities of the two organizations. Such confusion is complimentary, for it speaks for smooth integration and superb cooperation. Under the CMR the medical research facilities of the nation,—which to a large extent means the research facilities of the medical schools,—were mobilized for streamlined action. As of December 1, 1944, 496 research contracts had been executed with 120 different institutions. Under such contracts investigators scattered all over the country have been devoting their time and imagination to solving problems of wartime medical interest. The more important problems have generally been assigned to a number of groups of investigators in different laboratories. Unnecessary duplication of work is prevented by frequent reports from each group sent out to all concerned. As often as seems desirable, conferences are held among the groups. These conferences are attended not only by the investigators but also by representatives of the armed services who keep the scientists informed of current urgent needs. Great credit is due the organizers who have managed these affairs to provide information and promote cooperation without the regimentation which would kill individual initiative and imagination.

There are two aspects of the functioning of this machine which to me have been both revealing and inspiring. Of these I should like to speak briefly.

The first aspect concerns the willingness of people everywhere to cooperate. A portion of my personal work, which has a single end in view, has brought me in contact with representatives of the offices of the Surgeons General of the Army and Navy, with officers from the National Institute of Health, with

business men and scientists from a large pharmaceutical house, with a score of investigators in five scattered localities. I have met them individually and conferred with them in groups,—representatives of four different arms of the Government, a business concern and a bunch of prima donnas. With solemn wonder I report universal cooperation in striving toward attainment of the goal. True enough there have been frank differences of opinion. Such differences both stimulate progress and engender caution in leaping too boldly ahead. But, in their expression, sincerity of motive has never been impunged. "All of this," you may say, "is a phenomenon of war. In a time of national peril, all groups naturally cohere against the common foe." I cannot deny that some truth exists in an assertion of this type. At the same time, there is another direct and simple explanation. The sincerity and the intelligence of the individuals who represent organizations with somewhat conflicting interests compel me to believe that much of what has happened has resulted from the simple measure of getting together. People have known the value of "sitting down together" for a long, long time. War has promoted the practice on a new and larger scale. The resulting enrichment of medical science has far exceeded in value the cost of getting people together.

In making these comments, I am consciously watching a seedling which, I hope, will grow and flower after the war. Our national medical meetings do not cover the field of the conferences for which I am pleading. Such meetings usually mean gatherings where surgeons get together, where internists get together, etc. They are essential to progress in the several medical specialties. But, they cannot replace conferences on specific medical problems attended by bacteriologists, biochemists, business men, physicians and all other groups having a remote but necessary part to play in making a medical dream come true.

The other aspect of NRC and CMR activities, of which I wish to speak, concerns the shattering of a former personal belief. At the outset of war, I thought that any attempt to integrate and coordinate the scientific medical men of the country would be detrimental to the birth of new ideas. I admitted readily that ideas which had already sprouted could be forced to fruition by determined and concerted effort. But I feared that the years of plenty were destined to be followed by years of famine until scientists could once more find time to dream. I am now convinced that this thinking was wrong. New ideas which are truly great products of imagination are rarer than flawless emeralds. They have never been so numerous in a single generation as to permit the statistician to correlate their incidence with factors of environment. But, new ideas, which in their significance may be great or only mediocre, are not infrequently rewards to the diligent. They come in the form of unexpected findings in the course of routine experiments and usually lead to the comment, "Who'd have expected it?" Because the exigency of war has spurred forward looking men toward greater diligence, the record shows an imposing array of new and promising ideas. "But," you may argue, "many new ideas have been stifled because their development would not affect the prosecution of the war." An idea born is not an idea lost even though development has had to be delayed. Those

concepts will remain to form the nuclei around which postwar research will be shaped. And, those ideas which had promise of military usefulness have not been delayed in development but rather have moved with bewildering speed toward practical application.

This aspect of war research deserves a moment of thoughtful reflection. Medical knowledge, created out of the desperate need to combat the destruction of war, will remain as a heritage after all firing has ceased. Some solace for the tragedy is found in the thought that the heritage will continue to save lives in the years of peace, that after some time, and I think not such a long time, more lives will have been spared because of the knowledge than were lost on the field of battle.

Many of you know that plans are now being drawn for the creation of a "National Commission for Medical Research." Many men have been impressed by the rewarding result to medicine of integrated scientific effort. There is a general feeling that methods of cooperation which have produced astonishing results in time of war should not be discarded in the years of peace. It is my hope that such a Commission will come into being. I hope, further, that it will be organized so as to protect and encourage individual imagination and also so as to hasten the fulfillment of promising concepts wherever their place of birth.

JOURNAL
OF THE
Association *of* American Medical Colleges

Volume 21 MARCH, 1946 Number 2

Deceleration

A questionnaire was sent to all the member medical colleges to obtain data on whether they plan to decelerate and if so, how. A complete analysis of this information is now being made and when completed it will be distributed to all the colleges. At first glance, it is apparent that some of the colleges did not answer the questions as it was hoped they would. However, it is evident that deceleration will be instituted by all colleges except five who will continue on an accelerated basis. Three colleges reported that they would decelerate in the Fall of 1947; one college will do so gradually. Thirty-three colleges reported that they will start all classes on a decelerated basis in the Fall of 1946. Thirty colleges will continue acceleration for junior and senior classes but will decelerate for freshmen and sophomores.

Quite a number will have juniors and seniors start their year in the Spring of 1946, but they will take only the first quarter or semester of the year; they will vacation during the summer and continue the work of their respective years in the Fall. Thus, these students will come under the ruling of Selective Service which will accept for deferment only a normal vacation period of approximately three months' duration. A few colleges will lengthen the junior and/or senior years to eleven months or forty-eight weeks. This plan will finally terminate acceleration by 1947. In two colleges it is optional with juniors and seniors to continue on an accelerated program; these schools operated under such a program before the war. One college has been on a complete quarter system for many years and will continue to operate in that manner. Therefore, this college is not affected by acceleration or deceleration.

The graduating dates vary considerably. Two colleges will graduate two classes in 1946, January and October, and February and October. The graduating dates for the remaining colleges are: February, 3 colleges; March, 46 colleges; April, 4 colleges; May, 2 colleges; June, 8 colleges; July, 1 college, and December, 1 college.

As stated above, a complete analysis of these questionnaires will be published later.

◆ ◆

Evaluation of Psychometric Tests

The Association of American Medical Colleges has appointed a committee to study and to attempt to evaluate the many psychometric tests now used by medical schools as aids in the selection of students. Since 1930, the Association has sponsored the medical aptitude test developed by Dr. F. A. Moss. After a careful study of this test by a special committee appointed for that purpose by the Association in 1934, the committee reported favorably and in 1935 the test was adopted as a permanent activity by the Association. Since then, many other similar tests have been developed. Therefore, it was deemed advisable to make a study to determine, if possible, which test or combination of several tests had the greatest value in determining intelligence or aptitude, especially for medicine. Numerous studies made by the Committee on Medical Aptitude Test of the Association of American Medical Colleges have shown that it has a high predictive value. Other tests not specially designed to determine aptitude have also been found to have high predictive value. The time will probably never come when all medical schools will use the same test in the selection of students, but it is well worth while to

determine the merits of each test, especially when used by someone other than the developer of the test—and, if possible, to unite on one or, at most, two tests designed to show degrees of intelligence and aptitude for the study of medicine.

The committee appointed by the Association of American Medical Colleges in October, 1945, to make this study consists of Dr. Carlyle F. Jacobsen, associate dean, Washington University School of Medicine, chairman; Dr. Wm. S. McEllroy, dean University of Pittsburgh School of Medicine; Dr. J. Parsons Schaeffer, professor of anatomy, Jefferson Medical College; Dr. E. F. Lindquist, University of Iowa, and Dr. George P. Berry, assistant dean, University of Rochester School of Medicine. Dr. McEllroy and Dr. Schaeffer are members of the Committee on Medical Aptitude Test of the Association of American Medical Colleges. The new committee will report its findings at the 1946 annual meeting of the Association.

◆ ◆

Planning for War

As a preparedness measure for the part to be played by medical schools in turning out an adequate number of graduates to supply the medical personnel needed by the armed forces in time of war, the Executive Council of the Association of American Medical Colleges has appointed a committee to make a thorough study of this problem. World War II gave us the Army Specialized Training Program and the Navy V-12 Program. Medical schools accelerated their courses. The elimination of long vacations made it possible to condense the usual four academic courses into three calendar years. Thus an additional class was graduated in three years, which would not have been the case under the old schedule. Internships and residencies were reduced to nine months' duration.

What effect these measures had on the quality of students and graduates has not yet become apparent. An overall survey must be made to give the answer to this question. Doubtless this general speed-up did not yield the best results so far as education is concerned. This was especially true of the premedical preparation which was not only shortened but sharply condensed. However, it is futile to make conjectures. The actual facts must tell the story. Acceleration alone took a heavy toll. Medical schools could not have stood up under this strain much longer. Reduction in the number of teaching personnel also was a deterrent to effective instruction. Many departments were stripped almost completely of their best teachers.

To find the answers to these questions and to prepare a plan of operation for future emergencies is the assignment given to this committee appointed by the Executive Council. The personnel of the committee is as follows: Dr. George Packer Berry, chairman, assistant dean, University of Rochester School of Medicine; Dr. Dayton Edwards, assistant dean, Cornell University Medical College, and Dr. Stockton Kimball, assistant dean, University of Buffalo School of Medicine.

◆ ◆

The 1946 Meeting

Because of wartime conditions still effective in New Orleans, the Executive Council of the Association of American Medical Colleges has found it necessary to call off the 1946 meeting of the Association in that city. Hotel accommodations are not satisfactory; the established dates for holding the meeting are not available. Perhaps in another year or two it will be possible to meet in New Orleans.

The Executive Council has decided that now is a good time to try out an experiment, one which is entirely new in Association activities. Ever since the organization of the Association, the annual meetings have been held, on invitation, in cities in which a member college is situated. The plan has worked out well. However, it has become increasingly apparent in the past few years that outside distractions have infringed heavily on the time which should be given

to the program and especially the executive session. There has not been enough time for full discussion of papers and business items. Now, more than ever before, it is incumbent on the Association to give careful consideration to many important items dealing with medical education in all its phases.

Therefore, it is proposed to hold the 1946 meeting in a popular resort, one which can accommodate the Association, which can be reached fairly easily by train and auto. Many such places have been suggested and will be contacted at once. When a selection is made due notice will be given to member colleges, organizations and individuals interested in medical education. Suggestions as to a likely or possible meeting place will be most welcome. Notify the secretary.

◆ ◆

Selective Service Status of Medical Students

The analysis and summary of the questionnaire recently returned by the medical schools of the United States presents some very interesting data on the selective service status of medical students attending the 1945-1946 academic year. The total number of students enrolled in all four classes is 22,861. The freshmen number 5,967. Both figures are considerably less than they were in the preceding year. Sixteen colleges with more than 400 enrollees each had 34.8 per cent of all students (7,945). Twelve of these sixteen colleges had more than 450 enrolles each (6,213). The largest number enrolled by a college in this group was 648; the smallest, 456. Four colleges of the sixteen had 404, 407, 410, 411 enrollees (1,632). In the twelve colleges having more than 450 enrollees, the figures are, 648, 605, 554, 528, 514, 512, 504, 484, 476, 474, 458, 456.

The women numbered 8 per cent (1,832) of all students. There were 866 women freshmen as against 450 in the preceding year. Only four colleges did not admit women. Six colleges had more than 10 per cent women in the freshman class: 11.4%, 11.5, 13.4, 13.5, 14.0, 15.0 respectively. One college admitted only women (47). In the senior class of all colleges, 241 women were enrolled.

Army enrollees in all four classes numbered 8,014; Navy, 6,223, a total for both armed forces training programs of 14,237, or 62.3 per cent of all students. For freshmen, the figures were: Army, 1,345; Navy, 2,983, or 50 per cent of all students.

The IV-F group shows a large increase from 110 in the 1942-1943 freshman class to 790 in the present freshman class. In all classes there were 1,732 IV-Fs. Further details on this group of students are not available for analysis at this time.

These data show that the total number of students enrolled for the current academic year was less than in the preceding year. That is also true of the freshmen. The women and the IV-Fs just about doubled in numbers in the freshman class and constituted 14.0 per cent of all students enrolled.

In the I-C Disc. group there were enrolled in all classes, 1,539; in the II-A group, 2,391; others, 1,485. Only 441 students of the II-A group enrolled as freshmen as against more than 1,600 in the preceding year. The I-C Disc. group fell about 30 per cent below the preceding year.

How many acceptable students will be available for the Fall of 1947? Whence will they come? Veterans? Premedics? Women? IV-Fs? The answers to these and other questions are sought by the medical schools.

◆ ◆

Waller S. Leathers

Dr. Leathers, former dean of Vanderbilt University School of Medicine, is dead. Dr. Leathers for many years was a member of the Executive Council of the Association of American Medical Colleges. He was also a vice president and in 1942-1943 served as president. His interest was largely in the field of public health and preventive medicine. He was professor and head of this department at Vanderbilt. At one time he

was health officer of Mississippi and dean of the School of Medicine of the University of Mississippi. He was very active in public health work. His most recent appointment was to membership on the Basic Medical Science Board of the State of Tennessee.

◆ ◆

Studies of Student Accomplishment and Applicants for Admission to Medical Schools

Since 1928, the Association of American Medical Colleges has maintained a Student Register which gives detailed information on all medical students in the United States, covering name, address, age, duration and college in which premedical work was done, medical school or schools attended with record of accomplishment and standing in class by thirds. Much use is made of this information by medical schools and interested groups and organizations. It is the only source whence all this information can be secured. Therefore, it is important that medical schools report promptly to the Association on the accomplishment of their students. The accelerated program has made it difficult to keep the register up-to-date. The opening and closing dates of annual sessions have been variable. It has been quite a task to follow along with this factor. Most colleges make returns promptly; some colleges are slow; others fail to make reports necessitating making repeated requests for the reports. Colleges can ease this situation completely if they will instruct the registrar to make these reports as soon as possible after a session ends. If this is not done, the register will not be complete and the information it should give is not what it should be.

Another important item, especially at this time, is to maintain the record of applications made for admission. Many men returned from service are eager to continue or to enter on medical study. Doubtless, some, if not many of them, have an application record which may operate against their being admitted. Unless all colleges send in the cards on applicants, this activity, too, will not be as complete as it should be. Application cards now in the files, date back to 1940. Lack of space at headquarters forbids keeping all cards received in the course of years. It is felt that keeping the cards for five years is all that can be done under the circumstances. The present holding goes back to before the war began. If the colleges will ask for the record of ex-service men, and others, the cards can be checked. There are now in the files about 200,000 cards. They should give whatever information a college desires on every applicant now making application for admission.

For this record to be complete, it is essential that all colleges send in these cards as soon as possible. Filing the cards alphabetically for any one year occupies the time of one person for at least three months. Since the office is shorthanded, it is advisable that cards be sent in when completed so that the work can be spaced over a longer time, with intermissions. Receiving the cards all at one time necessitates spending continuous time filing. This is another activity of the Association which is not duplicated elsewhere. Time has demonstrated that it is worth while. Some colleges have made use of this information. Those that have, have acknowledged its worth.

So, send in your reports and your cards as soon as possible. Do not wait to be reminded to do so.

◆ ◆

Edward A. Koch

Dr. Koch, for many years dean of the University of Buffalo School of Medicine, died recently. Several years ago, he sustained a coronary attack. Dr. Koch was a faithful attendant at the meetings of the Association. He made many friends with his charming personality.

College News

University of Texas
Medical Branch

The Galveston State Psychopathic Hospital, a unit of the Medical Branch under the direction of Dr. Jack Ewalt, professor of neuropsychiatry, has reopened for the diagnosis and management of acute cases of mental disorder. The hospital was transferred to the Medical Branch by legislative action. Its bed capacity has been increased to 120. The hospital furnishes special facilities for teaching and research in neurology and psychiatry.

Morris Pollard has been appointed assistant professor of preventive medicine and public health to take charge of teaching and research in virus disease.

The National Foundation for Infantile Paralysis, Inc., has granted $3,500 for the support of the work of Dr. A. Packchanian, Director of the Laboratory of Microbiology, to assist in the development of small animal host for poliomyelitis virus. The John and Mary R. Markle Foundation has granted $4,000 to aid studies on the chemotherapy of malaria under the direction of Dr. Wendell Gingrich of the Laboratories of Bacteriology and Parasitology. The foundation has also given a grant of $6,750 to support the studies on Rickettsial diseases under the direction of Dr. Ludwik Anigstein and Dr. R. W. Strandtmann of the department of preventive medicine.

The Winthrop Chemical Company has made a grant for the study of new anesthetics under the direction of George Emerson, Ph.D., professor of pharmacology.

Cancer research under the direction of Dr. W. A. Selle, professor of physiology, has received a grant from the International Cancer Research Foundation in Philadelphia.

A comprehensive gynecology survey of women in Texas State Institutions is being organized under the direction of Dr. Willard R. Cooke, professor of obstetrics and gynecology, and his associate, Dr. John W. Weaver. This survey is being made in cooperation with the State Board of Control. It is supported by a three year grant of $20,000 from the Eli Lilly Research Laboratories of Indianapolis.

Donald Duncan, Ph.D., professor of anatomy at Louisiana State University School of Medicine, New Orleans, has been appointed professor and chairman of the department of anatomy.

In June, 1944, Miss Rosalie B. Hite, of Houston, Texas, bequeathed to the University of Texas the bulk of her estate with instructions that the income be used in researches into the cause, prevention, treatment and cure of cancer. In carrying out the wishes of the donor, the Board of Regents of the University has established four post-doctoral and ten pre-doctoral Rosalie B. Hite Fellowships to be awarded to (a) properly qualified persons who have a doctoral degree (or the equivalent in training) and who wish to do or to continue research work which can qualify under a liberal interpretation of the terms of the bequest, or (b) graduate students who desire to fit themselves to do research in fields which will contribute to our fundamental knowledge of normal and abnormal cells. Preference will be given to persons who desire training in the borderline fields of biology and the physical sciences, such as cyto-chemistry, biophysics, enzyme and protein chemistry, and related biochemical fields.

Post-doctoral Fellowships: To be eligible for post-doctoral fellowships, a person must have a doctor's degree (or the equivalent in training) and have demonstrated competence in research. A stipend of $2,400 per calendar year (including a vacation of six weeks) is given in such cases. The holders of these fellowships will not be required to pay fees to the University. Research work

may be carried on either at the Main University at Austin, or at the M. D. Anderson Cancer Research Hospital at Houston, or at the School of Medicine at Galveston, depending upon which branch of the University best serves the interests of the investigator as approved by the Committee of Award.

Pre-doctoral Fellowships: An applicant for a pre-doctoral fellowship must have graduated with high scholastic standing from an institution of higher learning and must have had thorough training in the fundamentals of biology and chemistry so that he can profitably begin work at once in one or both of these fields at the graduate level. The stipend of the pre-doctoral fellowships will be $100 per month net; that is, the University will pay all fees. In case a person desires to continue work for an entire calendar year, a vacation of six weeks with pay will be allowed. Applications should be sent to the Dean of the Graduate School, University of Texas, Austin 12, Texas.

Doctor Frank Hawking of the Medical Research Council, London, gave a seminar recently on the "Chemotherapy of Tropical Diseases."

In order to assure coordination and uniformity of standards of research efforts the faculty has selected a Research Council to afford guidance and advice for staff members engaged in research. The Chairman of the Council is Doctor Robert M. Moore, professor of surgery.

M. F. Guyer, Ph.D., emeritus professor of zoology at the University of Wisconsin, has been given an honorary appointment as Lecturer in Genetics for the period of his visits in Galveston.

The following Post-Graduate courses have been scheduled for the near future. Physicians interested in registering for these courses should communicate with the Director of the Post-Graduate Division.

Physical Medicine March 4-7: Among the guest speakers will be Dr. Frank Krusen, professor of physical medicine, Mayo Foundation; Dr. Richard Kovacs, professor of physical medicine, New York Polyclinic Medical School and Hospital; Dr. Don W. Gudakunst, medical director, National Foundation for Infantile Paralysis; Dr. Robert L. Bennett, Director of Physical Medicine, Georgia Warm Springs Foundation; Dr. Robert F. Dow, formerly in charge of physical medicine, Percy Jones General Hospital, Battle Creek, Michigan; Major A. B. C. Knudson, Assistant Chief, Division of Physical Medicine, Veterans Administration. The course will include instruction in the theory and the technique of application of the various physical agents, and will emphasize the practical, clinical aspects of physical medicine. The last day, March 7, will be devoted to a discussion of rehabilitation, in conjunction with the following course. Physicians and physiotherapists are eligible.

Industrial Psychiatry — March 7-8: Sponsored by the department of neuropsychiatry and the Hogg Foundation for Mental Hygiene. The course will consist of practical suggestions and discussions on psychiatric problems in industries, the organization of psychiatric consultation services, and the efficient use of such services by personnel managers and industrial health physicians. The principal speakers will be Dr. Lydia Giverson, chief psychiatrist for the Metropolitan Life Insurance Company, and Dr. Victor Vogel, assistant chief medical officer of the Office of Vocational Rehabilitation, U. S. Public Health Service.

Obstetrics — March 11-16: This course will cover almost the entire field of obstetrics, and discussions being limited to new and current ideas and methods applying to individual topics. Guest speakers, subject to acceptance, are: Dr. Bayard Carter, Durham, North Carolina; Dr. A. H. Dippel; Dr. H. W. Johnson and Dr. R. A. Johnson, Houston, Texas; Dr. E. L. King, New Orleans; Dr. W. F. Mengert, Dallas Texas; Dr. R. D. Mussey, Rochester, Minnesota; Dr. E. A. Schumann, Philadelphia. The non-obstetric complications of pregnancy will be discussed by members of appropriate departments of the medical branch; and fundamental princi-

ples will be discussed where appropriate by members of various preclinical departments. This course is under the sponsorship of the Maternal and Child Welfare Division of the Texas State Board of Health, who will underwrite the tuition and expenses of sixty-five post-graduate students.

Internal Medicine—March 25-30: A course in general internal medicine, sponsored by the American College of Physicians.

Dr. E. L. King, professor of obstetrics, Tulane University School of Medicine, delivered the annual Alpha Omega lecture January 31. The Medical Dames of the Medical Branch, an organization of students' wives, have established a fund for the annual award of an appropriate prize to the most scholarly and needy first year student.

The Cutter Laboratories of Berkeley, California, has given a grant of $1,500 for the support of the studies of Dr. Wallace Sako, associate professor of pediatrics, on immunization in pertussis.

Dean A. M. Schwitalla, S. J., of St. Louis University Medical School, will be the speaker at the graduation exercises March 2nd.

◆ ◆

University of Utah
School of Medicine

Dr. Randolph T. Shields, formerly surgery resident at the University of Pennsylvania, and more recently Major in the U. S. Army Medical Corps in the China-Burma-India theater, has been appointed instructor in surgery. Dr. Crichton McNeal, now stationed at the Army Institute of Pathology in Washington, D. C., has been appointed instructor in pathology. Dr. David W. Morgan, now at the Regional Hospital, Camp Swift, Texas, has been appointed clinical instructor in psychiatry. Dr. Scott M. Smith has been named assistant clinical professor of anesthesiology and acting head of the newly established department of anesthesiology. Dr. G. Albin Matson, associate professor of bacteriology, who has been on active duty in the U. S. Army Sanitary Corps since 1942, has return to his position in the department of bacteriology.

Dr. Chester A. Stewart, professor of pediatrics at Louisiana State University, recently delivered two lectures in the Intermountain Pediatrics lectureship series sponsored by the Utah Medical Foundation. Dr. Stewart spoke on "Evolution of Tuberculosis in the Human Body," and "Control of Tuberculosis." Dr. Louis S. Goodman, professor and head of the department of pharmacology, was the speaker at the November meetings of the Portland Academy of Medicine, Portland, Oregon. Dr. Goodman's lectures were: "Recent Progress in Drug Therapy," and "Horizons in Medical Research." Dr. L. T. Samuels, professor of biochemistry, took part in the post-graduate courses given in Chicago, Illinois, sponsored by the American College of Physicians. His subject was "The Relation of Nutrition to the Hormones."

The Abbott Laboratories of North Chicago, Illinois, has made another grant of $1,500 to the Department of Pharmacology for the continuation of research on anticonvulsant and other drugs. The Amalgamated Sugar Company of Ogden, Utah, has donated $300 to assist in remodeling Dr. G. A. Matson's research laboratory in the Department of Bacteriology. The Givaudan-Delawanna Corporation has granted to Dr. P. B. Price, professor of surgery, $5,250 for the investigation of skin disinfection. The Utah Medical Foundation has contributed $500 to the School of Medicine for the purchase of books and journals for the medical library.

During 1942 when the medical students were placed on active duty in the armed forces, a voluntary payroll contribution plan was initiated whereby each student in the military service donated $2 monthly toward a student loan fund to be used to assist in financing medical education of needy civilian students. At the present time this fund totals $4,000.

Harvard Medical School

Beginning February 1, 1946, the Harvard Medical School will offer to medical officers upon discharge from the Armed Forces a six months course in medicine and surgery. This course will be designed to provide instruction in the fundamental concepts of medical and surgical practice. Emphasis will be placed upon a clear presentation of current scientific knowledge and theories of normal and morbid conditions, and recent advances in such subjects as chemotherapy, infectious diseases and degenerative disease. Lectures and seminars on important developments and concepts in the fundamental sciences will be closely integrated with clinical discussions and the presentation of clinical material. Use will be made of all of the facilities of the medical school and its affiliated hospitals. Instruction will be given by the regular members of the preclinical and clinical departments of the Harvard Medical School. The case method of teaching will be employed as fully as possible, and informal discussions in small groups will be utilized.

From 35 to 40 men will be accepted for the first class. Each month thereafter 5 or 6 men will be enrolled up to a total of 60. An additional 10 men will be accepted for a review of pediatrics. Candidates will be selected on the basis of previous medical school and institutional training, experience in practice and service record.

Application for admission should be made to the Assistant Dean of Courses for Graduates, Harvard Medical School, 25 Shattuck Street, Boston 15.

Tuition for the course will be $360.00. This plan comes under the provisions of Public Law 346, "G.I. Bill of Rights." An additional fee of $15.00 will be charged to cover medical care and hospitalization.

The Medical School and the hospitals which cooperate with it recognize their obligations to returning medical officers for the provision of further opportunities for intensive and special training. Provision has been made by the hospitals for the establishment of residencies or their equivalent up to the limit of their individual capacities. These residencies and fellowships are on the basis of one-year tenure and will provide individual training under close supervision, particularly for those men whose initial training was interrupted by the exigencies of war. The hospitals may make a few of these positions available to graduates of the course. Full information regarding such positions on House Staffs of individual hospitals may be obtained by direct application to the hospitals concerned.

* *

University of Minnesota Medical School

The Ebin Foundation of Minneapolis has granted $25,000 to support five graduate medical fellowships of $1,000 a year each to be awarded to veterans of World War II. Dr. Carl J. Potthoff, associate professor of public health and preventive medicine, has resigned to become assistant medical director of the American Red Cross.

An electron microscope has recently been installed in Millard Hall. The following are among the investigations which will involve the use of the microscope: the intracellular identification of a virus-like agent responsible for the high percentage of mammary carcinoma in susceptible strains of mice, microscopic examination of bone, dentin and enamel, a study of the nature of virus inclusions in certain diseases such as vaccinia and herpes, and studies of the finer detail of bacteria with diameters of the order of 0.5 micron.

The Variety Club of the Northwest has offered to sponsor the construction of a hospital on the medical campus of the university to be known as the Variety Heart Club of the Northwest. A movement has already started to provide for a $325,000 structure. It will be financed by all northwestern residents who are interested in the advancement of public health. The Variety Club will pledge a minimum of $25,000 a year to the institution for the care of children from

counties that do not have funds available for such care. The unit will comprise a hundred beds, completely equipped to treat patients with rheumatic disease. It will also be an outpatient clinic in which ambulatory patients from the entire Northwest can be examined and obtain diagnosis.

The George Chase Christian lecture in the field of cancer research was delivered by Dr. Leonell C. Strong, associate professor of anatomy, Yale Medical School. His subject was "Mice, Men and Malignancy" and "Experimental Gastric Carcinoma in Mice."

The Mayo professorship in public health was created by the Mayo Properties Association by a gift of $150,000. This is the first permanently endowed professorship in the university in the School of Public Health.

The medical school is now cooperating with the Veterans Administration in the professional service of the Minneapolis Veterans Hospital.

Dr. Robt. A. Aldrich and Dr. Clifford G. Grulee, Jr., have been appointed to special teaching assistantships in pediatrics and Dr. Chas. U. Culmer to similar post in surgery. These positions are supported financially by the Rockefeller Foundation as part of its program to aid in the development of selected young men whose preparation for teaching and research posts was interrupted by military service. Additional appointments are under consideration in surgery, in neuropsychiatry, and in preventive medicine and public health.

Dr. Donald W. Hastings has been appointed professor and head of the department of psychiatry to succeed Dr. J. Charnley McKinley who resigned because of ill health.

◆ ◆

Cornell University
Medical College

The college will offer a Graduate Course in Internal Medicine for six months beginning April 1, 1946. The teaching facilities of the Second Medical Division, Bellevue Hospital, comprising 145 beds, will be devoted exclusively to this work. The course will be designed to give practical instruction in internal medicine, neurology, pediatrics and pathology.

The major feature of the course will be a period of practical experience on the wards and in the outpatient department at Bellevue Hospital. The first two weeks will be devoted to didactic instruction in the form of lectures, conferences and demonstrations in the fields of internal medicine and neurology. This two weeks' refresher course may be attended by a maximum of fifty physicians, including those who have registered for the practical course.

Registration for the complete course will be limited to twenty-five physicians. The work will consist of daily bedside study of patients on the medical and neurological wards. Each physician will be assigned patients and will cooperate with the house staff and attending staff in the diagnosis and care of these patients. Each week, pathological, medical, chest, gastro-intestinal x-ray, and combined medical-surgical conferences will be held. There will be an opportunity for a limited number of men to obtain special training in cardiology, hematology, diabetes, endrocrinology and gastrointestinal diseases by working in these special clinics. A clinical conference in pediatrics will be held weekly by the Department of Pediatrics. Veterans will have preference, but doctors from civilian practice will also be accepted. Fee: Two weeks course, $50; six months course, $250.

Inquiries should be addressed to Dr. John E. Deitrick, Director, Second (Cornell) Medical Division, Bellevue Hospital, First Avenue and Twenty-sixth Street, New York 16, New York.

◆ ◆

University of Louisville
School of Medicine

Appointments to the Commonwealth Fund Visiting Professorships for the current school year to date are as follows:

Captain D. B. Foster, M.C., Percy Jones General Hospital, Battle Creek, Michigan, visiting professor of neurology and neurological surgery, October 8-20, 1945.

Dr. Carl J. Wiggers, Department of Physiology, Western Reserve University School of Medicine, visiting professor of physiology, November 12-December 1, 1945.

Lt. Col. Brian Blades, Chief of Thoracic Surgery, Walter Reed General Hospital, Washington, D. C. Also Consultant in Surgery to the Surgeon General, visiting professor of surgery, December 7-19, 1945.

Dr. Carl Casky Speidel, professor of anatomy at the University of Virginia School of Medicine, has been in residence for the month of January as Commonwealth visiting professor in anatomy. Dr. Speidel gave lectures, conducted seminars and demonstration on the growth, regeneration and activities of nerve cells, muscles and sense organs in the living animal, illustrated by microphotographic moving pictures.

All visiting professors have given special lectures to the students and staff on subjects chosen from their own studies. Those of them with clinical interests have held special clinics and ward rounds, while the visitors with laboratory interests have given laboratory demonstrations of special techniques. All visiting professors have been selected as guest speakers at the regular meetings of the Jefferson County Medical Society.

◆ ◆

Woman's Medical College of Pennsylvania

At the 94th commencement held January 10th Dr. Anton J. Carlson, emeritus professor of physiology, University of Chicago, delivered the commencement address, "The Endless Frontiers in Medicine." Of the eleven living members of the class of 1896, two were present to receive the Fifty-year Medal awarded by the Alumnae Association to the members of the class.

Dr. Margaret D. Craighill, Dean of the College, has returned to take up her duties after an absence of two and one-half years. Dr. Craighill entered the U. S. Army Medical Corps in May, 1943, with the rank of Major, the first woman to be commissioned an officer in the Army. Between October, 1944, and June, 1945, Major Craighill, as Consultant of the Women's Health and Welfare Unit, made a trip around the world to inspect the facilities for members of the Women's Army Corps and Army Nurse Corps. In recognition of this and other outstanding service Major Craighill recently received the Citation for Legion of Merit and was promoted to the rank of Lieutenant Colonel. Lt. Colonel Craighill has also been appointed consultant for the medical care of women veterans, the first position of its kind in the Veterans Administration. In Dr. Craighill's absence, Dr. Marion Fay, professor of physiological chemistry, served the college as acting dean. At a luncheon held in Dr. Fay's honor recently, the faculty of the Woman's Medical College expressed its gratitude for her devoted service during the two and one-half years that she held this position.

Dr. Joseph Hughes has been appointed professor of psychiatry to succeed the late Dr. Harold D. Palmer.

◆ ◆

Boston University School of Medicine

Dr. Hans O. Haterius has been appointed professor and chairman of the department of physiology. Dr. Haterius received his Ph.D. from the University of Iowa in 1928. Prior to his new appointment Dr. Haterius was professor of physiology at Wayne University College of Medicine. Dr. George L. Maison has been appointed associate professor of physiology. Dr. Maison graduated from Northwestern University Medical School in 1935. From 1940 to 1942 he was assistant professor of physiology at Wayne University College of Medicine. During the war Dr. Maison served as a major in the Medical Corps A.U.S., and was engaged in aero-medical research. For his work in developing an

anti-G suit, Dr. Maison was awarded the Legion of Merit.

The school will offer a six months' course for medical officers who have been discharged from the Armed Forces. This course will be designed to provide opportunity for veteran officers to acquaint themselves with recent advances in medicine, to prepare themselves for practice, or to spend a short period advantageously while waiting for a hospital appointment. Teaching by the case method will be conducted on the wards and in the outpatient departments of the hospitals affiliated with the medical school, and in addition, regular teaching exercises will be held several times a week. Special conferences or seminars will be arranged as occasion arises.

Instruction in the following fields will be offered: Internal medicine, general surgery, orthopedic surgery, obstetrics and gynecology, urology, ear, nose and throat, and X-ray. If there is a demand for instruction in the preclinical sciences, courses in these subjects may be arranged. Since it is felt that the student will derive more benefit if he devotes an uninterrupted period of study to one subject, he is urged to spend the entire six months in one of the above fields. Arrangements can probably be made, however, to permit a few students to divide their time between two or more of the fields listed above if they so desire.

The course will begin on March 15, 1946, and will extend to September 15. The tuition fee will be $375. Application for admission should be made by writing to the Office of the Dean, Boston University School of Medicine, 80 East Concord Street, Boston 18, Massachusetts.

◆ ◆

University of Maryland
School of Medicine

The medical faculty of the University of Maryland offers an eight-week course ("refresher") to physicians planning to resume general practice. The course will begin April 15, 1946, and end June 8, 1946. It will not be given to less than fifteen, and the enrollment will be limited to thirty. While open to graduates of any approved medical school, preference will be given to veterans who are graduates of the University of Maryland. No examinations or credit of any kind will be awarded as the course is not designed to prepare men for board certification.

Emphasis will be placed upon recent developments in the fields of medicine, surgery, pediatrics, obstetrics and gynecology. Material will be presented by the staffs of those departments in the form of lectures, clinics and ward rounds, symposia, and conferences (including pathological) arranged for pertinent subjects. The departments of pathology and bacteriology will cooperate in the clinical teaching; the department of pharmacology will give a short series of lectures on recent trends in chemotherapy; and the department of physiology a series on recent advances in that field of clinical interest.

All inquiries and applications should be addressed to the Office of the Dean, University of Maryland School of Medicine, Greene and Lombard Streets, Baltimore 1, Maryland. Applications must be submitted no later than April 10, 1946.

Letters of application should include: (1) Applicant's name, age and permanent address; (2) a summary of military record; (3) medical school from which graduated and date of graduation; (4) hospital training, and previous medical experience. Students will provide their own living quarters and subsistence. Tuition $100.00.

January 1, 1946, the regular course of instruction in anesthesiology was augmented by the establishment of a separate service of anesthesiology in the University Hospital, the principal clinical teaching unit of the School of Medicine.

The Sugar Research Foundation has given a grant of $1,500 to study the fate of saccharic acid in the animal body under the direction of Dr. C. Jelleff Carr, associate professor of pharmacology.

Emory University
School of Medicine

Dr. Richard Hugh Wood has been appointed associate professor of medicine and physician-in-chief at Emory University Hospital. The position of physician-in-chief is a newly created one and Dr. Wood is the first appointee.

Emory announced the establishment of a department of physical medicine at its hospital and the start of a five year program in the specialty for Atlanta and the Southeast under a grant of $167,000 from the National Foundation for Infantile Paralysis. The department will be operated by Emory under the direction of Dr. Robert L. Bennett, director of physical medicine at Georgia Warm Springs Foundation and newly appointed professor of physical medicine on the medical school faculty. Dr. Bennett will divide his time between Warm Springs and Atlanta. Plans also call for appointment of an assistant director in charge of research and a staff to include a resident, two technicians and a secretary. After the first year the staff will be gradually enlarged to reach a total of seven specialists and two secretaries by the end of the five year period. The staff "will investigate various phases of physical therapy and cooperate with other departments in the university medical school in the application of physical medicine to the treatment of patients." The program will provide for extensive research in the field of physical medicine as applied to neuromuscular diseases, particularly poliomyelitis; a schedule of training for doctors in physical medicine and for technicians in physical therapy, and establishment of facilities for the treatment of victims of infantile paralysis and other diseases by physical therapy.

◆ ◆

Columbia University
College of Physicians and Surgeons

The faculty of medicine of Columbia University and affiliated hospitals announce the establishment of a program of graduate training in physical medicine.

The purpose of this program is to provide a sound background for a career in the field of physical medicine based on clinical experience under supervision and an appreciation of the related fundamental sciences.

An adequate training for specialization extends over a period of approximately three years. Initial appointments are for a period of sixteen months beginning March 1, 1946, and consist of four months of basic instruction at the university followed by a year of supervised clinical work at one of the participating hospitals. Appointments are made annually but are subject to renewal for one or two additional years during which clinical responsibilities are increased and participation in instruction and investigation is encouraged.

The stipend varies with the hospital but includes maintenance or its equivalent.

Applicants must have graduated from a medical school and have completed an internship approved by Columbia University.

Applications should be submitted to the directors of the following hopitals: Presbyterian Hospital, New York Post-Graduate Hospital, Mount Sinai Hospital, St. Luke's Hospital, Goldwater Memorial Hospital, Montefiore Hospital and Hospital for Joint Diseases.

Sharp and Dohme, Inc., has given $2,200 to Columbia University College of Physicians and Surgeons in support of Dr. Erwin Brand's work on proteins and amino acids.

◆ ◆

University of Colorado
School of Medicine

Dr. Ward Darley has been appointed dean. Mr. Robert C. Kniffen is superintendent of hospitals. Both positions were held by the late Dr. Rees.

To perpetuate the memory of Dr. Maurice H. Rees, for many years dean of the University of Colorado School of Medicine, the board of regents has authorized the establishment of a fund to be known as the "Dean Maurice H. Rees Scholarship Fund." The scholarship, to

consist of tuition and the income from funds donated by students, alumni, faculty and friends, is to be awarded each year to a student entering the junior class of the school of medicine who has shown, in addition to excellent scholarship during his first two years, those fine qualities of character and conscientious devotion to duty manifested by Dean Rees during his lifetime. Dr. Rees, who died May 25, 1945, joined the Colorado faculty in 1921 as professor of physiology and pharmacology, becoming dean in 1925.

A series of refresher courses has been set up at the medical school. Registration blanks are available at the school. The fee schedule for all courses will be computed at the rate of $10.00 for the first day and $5.00 for each subsequent day. Thus, a two-day course would be $15.00, a three-day course $20.00, and a four-day course $25.00, etc. Medical officers released from the armed forces will receive the courses under the GI Bill of Rights and will have only to fill out the required papers. Laboratory fees, etc., are not contemplated.

◆ ◆

College of Medical Evangelists

Dr. Newton G. Evans, for many years closely associated with the college in various capacities, died after a comparatively short illness, December 19, 1945. Dr. Evans graduated from Cornell University Medical School in 1900. His interest was pathology. In 1914 he became president and professor of pathology of the college. He remained professor and head of the department until the time of his death. When Dr. Magan was made president of the school in 1927, Dr. Evans became dean, in which capacity he served until 1931. He was pathologist and director of the laboratory at the Los Angeles County Hospital between 1931 and the time of his retirement on June 30, 1944. At that time he again became dean of the college, in which capacity he served for one year, but on account of failing health was forced to relinquish these responsibilities. As a teacher of medical students Dr. Evans was outstanding. As a scientist, he made many contributions to medicine. Among those who knew him best he was always respected for his complete honesty and his sturdy integrity. He was a bibliophile of no mean ability. His continued interest in many libraries caused him to be appointed one of the counsellors for the Surgeon General's Library.

Dr. Wesley W. Spink, associate professor of medicine, University of Minnesota Medical School, gave the first annual Newton G. Evans Lecture in bacteriology and pathology. His subject was "Brucellosis: Diagnostic and Therapeutic Consideration."

◆ ◆

Southwestern Medical College

The medical staff at Baylor University Hospital, Dallas, has been reorganized and a medical board created to supervise the teaching program at the hospital. The new board is composed of thirteen Dallas physicians appointed by the trustees as chiefs of various medical and surgical services. Its purpose will be to raise hospital standards, furthering medical instruction and medical research, direct the staff and organization and supervise the teaching program for residents and interns. It will also cooperate in the teaching of medical students at Southwestern Medical College, Dallas, and assist in dissemination of medical information to the public. Membership of the new board includes: Dr. Earl F. Weir, anesthesiology; Dr. Henry M. Winans, internal medicine; Dr. Albert P. D'Errico, neurologic surgery; Dr. William K. Strother, Jr., obstetrics and gynecology; Dr. Lester H. Quinn, ophthalmology; Dr. Felix L. Butte, orthopedic surgery; Dr. Lyle M. Sellers, otolaryngology; Dr. Joseph M. Hill, pathology; Dr. Robert L. Moore, pediatrics; Dr. Guy F. Witt, psychiatry and neurology; Dr. Frank M. Windrow, radiology; Dr. Harry Cochran, surgery; Dr. Alfred I. Folsom, urology.

Officers of the new board are: Dr.

Winans, chairman; Dr. Folsom, vice chairman, and Dr. Hill, secretary-treasurer. The board has selected the staff which will carry on the active teaching program.

◆ ◆

New York University
College of Medicine

Extensive plans are in the making in cooperation with city welfare agencies to develop a New York University-Bellevue Medical Center. The city is planning to build a new Bellevue Hospital along the most modern lines. New York University will supply the needed professional facilities to complement the hospital development. The plan is an extensive one. Fulfillment will come only after the passage of years, but there is no question that it will come.

Funds for Alumni Hall, the auditorium of the College of Medicine's new medical center, now total $425,000. The $500,000 goal is expected to be reached early in February. The 500-seat auditorium will be used for an educational program planned to meet the postgraduate needs not only of alumni but of all physicians in the New York area with the aim of developing a permanent affiliation between the academic and practicing branches of the profession. The building will also house Alumni Association offices of the College of Medicine.

Dr. Currier McEwen, dean, has returned to his duties after separation from government service.

◆ ◆

Long Island College of Medicine

The college will purchase all but a small portion of a six and one-half acre tract of land facing Kings County Hospital for an additional campus. It is proposed that the buildings the college now utilizes be re-developed as a clinical teaching center, in cooperation with the Long Island College Hospital and that new basic science and other teaching facilities and research laboratories be built at the Kings County site. Proposals to extend the college's activities in industrial medicine are being incorporated in the planning for the Henry Street campus. The college expects to continue its "multi-center" plan of clinical teaching in which ten hospitals and two health agencies in Brooklyn now cooperate and to extend its affiliations where definite gains in the educational, research or service phases of the program are indicated.

Brooklyn State and Kingston Avenue Hospitals are adjacent to the Kings County Hospital. The three together contain 6,655 beds, probably the largest aggregate of hospital beds in the eastern United States. The Long Island College division of Kings County Hospital where the college has had a teaching affiliation for a number of years includes the branches of medicine, surgery, obstetrics and gynecology and pediatrics and the laboratory sciences in pathology, bacteriology and biochemistry. Its students also study at the Brooklyn State and Kingston Avenue Hospitals.

◆ ◆

University of South Dakota
School of Medicine

The expansion of the two year school to a four year curriculum was authorized by the 1945 legislature. Detailed plans for the junior and senior years are being arranged by Dr. Joseph C. Ohlmacher, dean of the medical school, and Edwin H. Shaw, Ph.D., professor of biochemistry, in cooperation with physicians in private practice. Dr. Ralph L. Ferguson, formerly senior pathologist at Edgewood Arsenal, Maryland, has joined the faculty as professor of pathology and will assist in the organization of the four year course. The Sioux Valley and McKennan hospitals at Sioux Falls will be utilized for the junior year clinical work. The senior year will be organized on a preceptor basis, other hospitals in the state being utilized. The state institutions at Yankton and Sanatoria will also cooperate in the program.

Freshmen and sophomores will remain on the campus at Vermillion for the present.

Bowman Gray School of Medicine

Dr. Robert B. Lawson, assistant professor of pediatrics, returned from a year's leave of absence spent in virology at the George Williams Hooper Foundation, University of California. Dr. Lawson will resume his regular duties in the department of pediatrics. Dr. C. Hampton Mauzy, recently discharged from the army, has resumed his position on the faculty as assistant professor of obstetrics and gynecology. His status has been changed from part time to whole time. Dr. John R. Williams, Jr., has resigned as assistant professor of medicine to become associated with his father, Dr. John R. Williams, Sr., in the practice of medicine in Rochester, N. Y. New appointments include Dr. Weston M. Kelsey, Westport, Conn., instructor in pediatrics. William E. Cornatzer, Ph.D., assumed the position of assistant professor of biochemistry. Dr. Joseph T. Phillips, Jr., is the new instructor in biochemistry.

◆ ◆

Wayne University
College of Medicine

Dr. H. M. Weaver, professor of anatomy and administrative assistant, has resigned to join the National Foundation for Infantile Paralysis to coordinate and further the research program supported by the Foundation. Three members of the faculty have returned from service with the Armed Forces: Dr. Jas. W. Winfield, associate professor of surgery; Dr. Arthur W. Frisch, associate professor of bacteriology and clinical pathology, and Dr. L. H. Domeier, instructor in pathology.

◆ ◆

University of Vermont
College of Medicine

Grants: Armour & Company, $2,000 to Dr. E. E. Hays for studies on anemia. For studies to be conducted under the direction of Dr. H. B. Pierce and assistants: Drs. C. A. Newhall, T. B. Tomasi, T. H. Harwood, Susan B. Merrow, nutritionist, Dr. R. F. Krause, Mrs. Ruth Law and Mrs. M. B. Shepard. Milbank Memorial Fund, $17,700 for a two-year study of the nutritional status of Vermont children. Merck & Company, Inc., $6,300 for a one-year study of folliculosis among children.

◆ ◆

Medical College of the
State of South Carolina

Dr. William M. McCord, formerly associate professor of physiological chemistry at the Louisiana State University Medical School, has joined the faculty as professor and head of the department of physiological chemistry.

At a special meeting of the House of Delegates of the South Carolina Medical Association and other members in Columbia, S. C., on January 3, 1946, unanimous approval was given the construction program of the medical college. This includes a teaching hospital under ownership and operation by the medical school, in addition to hospital teaching facilities provided by the Roper Hospital, with which a cooperative agreement has been established. A committee consisting of a member from each county was established by the association to promote the Medical College program.

◆ ◆

McGill University
Faculty of Medicine

A department of anesthesia has been created under the chairmanship of Dr. Wesley Bourne.

Our main objectives are: (1) the improvement of the teaching of anaesthesia to the undergraduate student in medicine; (2) the enhancement of opportunities for learning anaesthesia by the interns of the hospitals connected with the university; (3) the maintaining of a three-year Diploma Course in Anaesthesia for those graduates in medicine who desire to become specialists in a complete manner; and, (4) the development of investigation in anaesthesia, in the way of interrelationship, in the clinic and in the laboratory, and, also, in an interdependent fashion with the university's other departments.

University of Mississippi
School of Medicine

Dr. B. S. Guyton, who has been acting dean of the University of Mississippi School of Medicine since the resignation of Dr. James B. Looper in June, 1945, resigned February 18, to become Dean Emeritus and professor of surgery. Dr. D. S. Pankratz, professor of anatomy since 1939, who has been assistant dean and chairman of the department of anatomy since June, 1945, was made acting dean. Ray J. Nichols, Ph.D., who was appointed associate professor of anatomy, June, 1944, has been promoted to professor of micro-anatomy. Dr. M. Eugene Morrison, an alumnus of this university (1937) has been appointed assistant professor of pathology, bacteriology and clinical laboratory diagnosis. George P. Blundell, Ph.D., is acting assistant professor of pathology and bacteriology. He came from Jefferson Medical College in 1945. Mrs. Bernice B. Rice, M.A., is instructor in bacteriology and clinical laboratory diagnosis. Dr. Lee Rogers, Jr., an alumnus of this university (1940) has been assistant professor of surgery since September, 1945. Dr. William T. Tyson, Jr., recently released from the Army, has accepted the position of acting associate professor of pathology. He is replacing Dr. Robert M. Moore, who resigned in June, 1945. Doctor Tyson had worked in the Institute of Pathology of the University of Tennessee College of Medicine before entering the Army.

◆ ◆

University of Georgia
School of Medicine

Frederick Stearns and Company, Eli Lilly and Company, and Ciba Pharmaceutical Products, Inc., have established grants to the Pharmacology Department totaling $5,400 for the year 1946. These funds are to support fellowships and technical help in investigating the pharmacology of the uterus in pregnancy and dysmenorrhea. One of these fellowships will be available in September, 1946, with opportunity for the fellow to take part time medical work.

University of Tennessee
College of Medicine

Dr. Frank Harrison, associate professor of anatomy of the College of Medicine and the School of Biological Sciences of the University of Tennessee, has been appointed professor of anatomy and chief of the division of anatomy. He will assume the post April 1, 1946, succeeding Dr. K. B. Corbin, who at that time will become associated with the Mayo Clinic.

Dr. E. C. Mitchell is now emeritus professor of pediatrics. Dr. F. T. Mitchell succeeds him as professor and head of the department of pediatrics. Dr. Jas. G. Hughes has been appointed associate professor on a full time basis.

◆ ◆

Temple University
School of Medicine

Dr. Curtiss Bronson Hickcox has been appointed professor and head of the department of anesthesiology.

Dr. Dean A. Collins has been appointed professor of physiology.

Contributions totalling $64,600 have been received: Building fund, $16,800; dermatology research, $500; urology and anatomy research, $4,600; chemistry research, $2,600; experimental neurology, $2,700; pediatric research, $3,000; pharmacology research, $18,000; surgical research, $500; surgical research fellowship, $2,000; medical research, $13,400.

◆ ◆

University of California
School of Medicine

A department of medical physics has been established within the department of physics on the Berkeley campus to apply the products of the cyclotron to the study of health and disease and for human betterment. Close liaison will be maintained with the medical school and the radiation laboratory, as well as with the department of physics. Because of the war, many men of the science departments still are on leave. However, work in the new department, headed by Dr. John H. Lawrence, will go forward as rapidly as possible.

University of Toronto
Faculty of Medicine

A grant of $4,538 was received from the National Foundation for Infantile Paralysis to continue research on the atrophy of denervated muscle. This grant supplements one of $21,166 previously received. The research project is conducted in the department of physiological hygiene under the direction of Dr. D. Y. Solandt, acting head of the department. Previous study under the same supervision and auspices has investigated the biophysical aspects of muscle atrophy, fibrillation, and changes in electrical and chemical excitability. Future research under the grant will emphasize the interrelation of these phenomena and possible methods of modifying them.

◆ ◆

Georgetown University
School of Medicine

Dr. Joseph T. Roberts, adjunct clinical professor of medicine, was chosen the Davidson Lecturer of the Medical Society of the District of Columbia in 1945.

Dr. Henry R. Schreiber, clinical professor of medicine, was recently promoted to professor and acting director of the department of medicine, filling the vacancy that occurred with the resignation of Dr. Wallace M. Yater. Dr. William F. O'Donnell was promoted to professor and acting director of the department of pediatrics to succeed Dr. Joseph S. Wall, who resigned after serving as a member of the faculty for forty-seven years. Dr. Charles A. Millwater was named associate professor of clinical pediatrics to succeed Dr. John H. McLeod, resigned.

◆ ◆

University of North Dakota
School of Medicine

The State Legislature appropriated $250,000 for a Science Building, which will house the laboratory medical sciences. The Legislature also passed a bill to establish a State Medical Center at the university. This means a clinic and a hospital of sufficient size to take care of at least a large part of the welfare work of the state when hospitalization and medical care are involved and, to make clinical teaching possible. It also created a State Medical Center Advisory Council of nine members. The law implies that this is to be a permanent board, but at the present time its duties can be only an investigation and study of all of the problems involved.

◆ ◆

Jefferson Medical College

The Annual Alpha Omega Alpha Lecture was delivered January 16, 1946, by Dr. Eugene M. Landis, George Higginson Professor of Physiology, Harvard Medical College, on "Venous Pressure and Cardiac Failure in the Laboratory and Clinic."

Dr. John H. Gibbon has been appointed professor of surgery and director of surgical research to succeed Dr. George P. Muller, who retires in March.

Dr. Thaddeus L. Montgomery has been appointed professor of obstetrics and gynecology and director of the Division of Obstetrics at the Jefferson Medical College. He will replace Dr. Norris W. Vaux, whose retirement becomes effective at the end of the current school term in March. The Department of Gynecology and the Department of Obstetrics at the Jefferson Medical College and Hospital will be combined. Dr. Lewis C. Scheffey, professor of gynecology, has been appointed head of the department, professor of obstetrics and gynecology, and director of the Division of Gynecology.

◆ ◆

Marquette University
School of Medicine

The school has by agreement with the Veterans Administration become associated in the management of the Milwaukee Veterans Hospital. Specialists from Marquette will be in full charge of the medical care of veterans. An organizing and operating committee has been appointed by Dean Carey.

University of Washington
School of Medicine

Dr. Robert Pitts, now at Cornell, will be professor and head of the department of physiology. Dr. Stuart W. Lippincott, formerly at McGill, will be professor and head of the department of pathology. Dr. William Eindle, formerly professor of anatomy at Northwestern, will head the department of anatomy. Drs. Richard Groat and Roland Becker have been appointed assistant professors. Pharmacology will be under the direction of Dr. James Dille, who has been a member of the faculty in the School of Pharmacy. He will receive the M.D. degree from Illinois in June. Several candidates are being considered for bacteriology and biochemistry. Appointments will be made shortly.

◆ ◆

Stanford University
School of Medicine

The Winthrop Chemical Company has extended for another two years its fellowship for the training of medical graduates in the teaching and research of pharmacology.

◆ ◆

University of Oklahoma
School of Medicine

Dr. Wann Langston, professor and chairman of the department of medicine, has been appointed acting dean of the school, filling the vacancy that occurred with the death of Dr. Tom Lowry, December 11. Dr. Lowry died from coronary embolism.

◆ ◆

University of Missouri
School of Medicine

Dr. Mazyck P. Ravenel, for many years a member of the faculty, died in January from pneumonia.

◆ ◆

Tulane University of Louisiana
School of Medicine

Dr. Maxwell E. Lapham has been released by the Navy and has resumed his duties as dean.

Johns Hopkins University
School of Medicine

Dr. Chas. B. Huggins, professor of urology at the University of Chicago, has been appointed director of the department at Hopkins and director of the Brady Urological Institute to succeed the late Dr. Hugh H. Young.

Dr. Warfield T. Longcope, since 1922 professor of medicine, will retire June 30. His successor will be A. McGehee Harvey, now assistant professor of medicine at Vanderbilt University.

◆ ◆

University of Rochester
School of Medicine

A teaching relationship has been established between the Medical School and the Genesee Hospital. Dr. John Romano has been appointed professor of psychiatry. Until recently he was consultant in psychiatry with the Army and a member of the faculty of the University of Cincinnati School of Medicine. He will be in charge of the new psychiatry clinic, the gift of Mrs. Helen W. Rivas, who recently gave the university $2,154,000.

◆ ◆

University of Washington
School of Medicine

Dr. Wm. F. Windle, director of the Institute of Neurology and professor of anatomy and head of the department at Northwestern University Medical School, has resigned to accept the positions of professor and head of the department of anatomy at Washington.

Dean Edward L. Turner is recovering from an operation for a bleeding duodenal ulcer.

◆ ◆

Syracuse University
College of Medicine

An expansion program to cost about $25,000,000 over a period of ten years is being planned. The program will include an expansion of the medical center, a new university hospital and an addition to Memorial Hospital.

University of Virginia
Department of Medicine

Dr. Chas. S. Venable has donated $1,500 in support of a lectureship in traumatic surgery which he established three years ago.

Dr. Chalmers D. Gemmill, associate professor of physiology in Johns Hopkins University School of Medicine, has been appointed professor of pharmacology to succeed the late Dr. Jas. A. Waddell.

◆ ◆

University of the Philippines
College of Medicine

The W. K. Kellogg Foundation has made an appropriation of sufficient size to provide scholarships for ten members of the faculty of the school whereby they may study at selected medical schools in this country for one year.

◆ ◆

University of Pittsburgh
School of Medicine

The Nu Sigma Nu Medical Fraternity, local chapter, has established a lectureship. Dr. John R. Paul, professor of preventive medicine in Yale Medical School, will deliver the first lecture.

◆ ◆

University of Illinois
College of Medicine

Dr. Douglas A. MacFayden has been appointed head of the department of biochemistry in the Rush Presbyterian hospital division of the college of medicine, and Dr. George M. Hass has been appointed head of the department of pathology.

◆ ◆

Hahnemann Medical College

Wm. G. Schmidt, Ph.D., chairman of the executive committee directing operation of the school, has resigned. Dr. John C. Scott, professor of physiology, has been appointed his successor. Dr. Harry Eberhardt has resigned as vice-president for medical affairs and Dr. Frederick J. von Rapp, former provost and vice-president, is now executive vice-president of the corporation. Dr. Schmidt is now associate dean in charge of student affairs.

◆ ◆

University of Oregon
Medical School

The Schering Corporation, Bloomfield, N. J., has created a research fellowship in endocrinology. The grant of $3,000 for one year's research on gonadotropic hormones is under the direction of Dr. Carl G. Heller, associate professor of physiology and medicine.

◆ ◆

Ohio State University
College of Medicine

Dr. Dwight Palmer, associate professor of neurology and psychiatry, has been made professor and chairman of a newly created department of neurology and psychiatry.

Dr. Isaac B. Harris, professor of clinical surgery, has retired.

General News

Baruch Committee on Physical Medicine

To advance and encourage research, teaching and training in the field of physical medicine—and to bring the benefits of this branch of medicine to the rehabilitation of persons maimed in war, industry or by illness — Bernard M. Baruch in 1944 made an initial grant of $1,100,000 to the Baruch Committee on Physical Medicine.

The first annual report of the committee, prepared by the medical director, Frank H. Krusen, M.D., of the Mayo Clinic, has outlined the progress in attaining the objectives of Mr. Baruch's endowment.

Eleven medical schools shared funds in the original grants: Columbia University, $400,000; New York University, $250,000; Medical College of Virginia, $250,000; Massachusetts Institute of Technology, $50,000; University of Minnesota, $40,000; University of Southern California, $30,000; Harvard University, $25,000; University of Iowa, $15,000; University of Illinois, $15,000; Washington University, $10,000; Marquette University, $5,000; Harvard received a later special grant of $30,000 for a special fellowship program.

Dr. Krusen summarized the following progress during the year at the specific institutions:

1. Columbia University, College of Physicians and Surgeons:

Creation of courses leading to a B.S. degree in occupational and physical therapy with enrollment limitation of 50 students yearly in each category. Plans are well advanced for the merger of New York Orthopedic Hospital with Columbia Medical Center and for a major expansion of physical therapy in the enlarged Vanderbilt Clinic and Harkness Pavilion. While awaiting the appointment of a research director, the medical school has undertaken to assist various departments in research projects in the field of physical medicine including: Insulin therapy in combination with fever therapy produced by physical means; studies of electric shock therapy; the effect of temperature on hemorrhage, fluid and electrolyte balance; distribution of volume of blood, and metabolic disturbances resulting from circulatory changes; basic problems of circulation in small vessels and capillaries; the use of radioactive isotopes in circulation investigations.

2. New York University, College of Medicine:

Dr. George G. Deaver has been appointed director of the program as professor of clinical medicine. The departments of physcal and occupational therapy at Bellevue Hospital have been combined into one department of physical medicine. Under the new plan, cases whose prognosis had been considered hopeless are now referred to the new department. Also, patients with poliomyelitis are referred for treatment and rehabilitation. Assistance is given to other departments in the treatment of patients with arthritis or fractures.

A feature of the program is a special laboratory where patients can be tested in activities essential to daily living. The use of crutches in walking, climbing stairs or curbs, care of daily need and even left-handed writing are typical examples. Hundreds of copies of the booklet describing these tests have been made available. An outgrowth of this work is the plan to devise a test to measure a patient's ability to perform any one of the more than 3,000 vocations listed in the job analysis survey of the War Manpower Commission. A physician who is also an engineer has been assigned to this research project from the Army Air Force. As a special project, the testing and rehabilitation of cases of spinal cord injury have been outlined in a manual

and in sound motion pictures to fit the current needs of soldiers who have spinal cord lesions. Efforts are under way to evaluate the functional capacity of cardiac patients and recondition them for industrial work.

3. Medical College of Virginia:

Dr. F. A. Hellebrandt has been appointed professor of physical medicine and acting director for the program studying hydrology, climatology and spa therapy. The director made a complete inspection of Leo N. Levi Memorial Hospital at Hot Springs, Arkansas. The spa is interested in cooperating with the work of the Baruch Committee in research on hydrotherapy. A basic research laboratory was founded and, despite lack of complete equipment, a research program was inaugurated including the study of: birefringence of mammalian muscles; changes in muscle proteins during atrophy; use of electric stimulation, massage or baths to overcome atrophy. Plans for future research include a study of supersonic waves and the development of techniques for creation of uniform arthritic lesions in experimental animals to test various hydrotherapeutic measures.

4. Massachusetts Institute of Technology:

Dr. F. O. Schmitt, head of the departments of biology and biological engineering, has been appointed director of the laboratory of applied biophysics. Dr. K. S. Lion is the immediate supervisor. As equipment on order is received, it is planned to investigate the dielectric properties of muscles and tissues in high frequency fields and nerve impulses by electronic methods.

5. Harvard University:

The Baruch grant was received one month prior to the annual report and in that short time it has been possible only to survey possible personnel and plan research on (1) biochemical factors relating to fatigue and (2) the psychiatric aspects of fatigue in psychoneurotic patients.

6. University of Minnesota:

Since the staff is only partly assembled, no report on research progress is possible at this time, but during the year, two groups, totalling 14 students, have been enrolled in the twelve month course on physical medicine under the direction of Dr. Miland A. Knapp. A third group of twelve students is currently taking this course. Dr. Herbert Wells has been appointed professor of biophysics and will direct research in physical medicine.

7. University of Southern California:

Under the direction of Dr. Irving Rehman, research planned or in progress includes: the evaluation of compensatory action of muscles or muscle groups; the use of soft tissue x-rays and metal pin implants to study muscle movement; the determination of electrical potentials in muscle contractions; the interruption of neuromuscular pathways by pressure, nerve section and chemicals; the effect of internal environment on regeneration of neuromuscular pathways and return of function.

8. University of Iowa:

Research in progress includes the use of thermogenic agents on deep tissue heating and the effects on circulation of short wave diathermy, in animal experiments.

9. Marquette University:

Research has centered on the effects of temperature changes on the neuromuscular apparatus with especial reference to thermal shock.

10. Washington University:

A two year research program on bodily mechanics is planned and personnel is being sought to carry it through.

11. University of Illinois:

Teaching personnel is being obtained to establish a training program in occupational and physical therapy.

◆ ◆

Harofe Haivri:
"The Hebrew Medical Journal"

Volume II, 1945, of *Harofe Haivri*, a semi-annual bilingual publication edited by Dr. Moses Einhorn, has appeared. The contents of this journal are not confined to technical medical topics, but are

divided into several sections covering a variety of related subjects, such as medicine in the Bible and Talmud, Old Hebrew Medical Manuscripts, Palestine and Health, etc. Under the topic of Historical Medicine, Prof. Nahum Slushtz of Palestine, writes an interesting article on Isaac Ben A'mran, famous physician and philosopher, who lived in Keiruhan in the middle of the 18th century and served as court physician to Emir of Zaduth Alla. In the section on Talmud and Medicine, Dr. M. Ben-Ami writes explanatory remarks on the medicine in the Bible; in addition, Dr. Z. Muntner discusses the social status of the physician in the Talmud.

◆ ◆

Symposium on Premedical Problems

Alpha Epsilon Delta, national honorary premedical fraternity, in conjunction with the Section on Medical Sciences, is arranging a special program on premedical advisory problems for the American Association for the Advancement of Science meeting in St. Louis, Coronado Hotel, 1:30 P. M., Friday, March 29, 1946. There is a strong feeling that the philosophy, content and methods of education in the field of premedical education should be examined and re-evaluated.

With this in mind, Alpha Epsilon Delta has organized a program designed to offer definite practical comments and information to premedical educators on a few of the most urgent problems in premedical education. Dr. Carlyle F. Jacobsen, assistant dean, Washington University School of Medicine, St. Louis, will present a discussion of the use and measurement value of the various objective methods of investigating the educational background of the student. This will be followed by a discussion by Dr. George T. Harding, School of Medicine, the Ohio State University, Columbus, of the personality traits to be found and recognized in recommending students for the study of medicine.

The second half of the program will deal with the length and content of the premedical curriculum. Dean Stanley Dorst, School of Medicine, University of Cincinnati, will present the point of view of the medical school and Dr. William C. Cole, Rutgers University, New Brunswick, N. J., that of the liberal arts college.

◆ ◆

Plastic and Reconstructive Surgery Journal

The American Society of Plastic and Reconstructive Surgery announce the publication of an official periodical to be known as Plastic and Reconstructive Surgery. The first number will appear in July and the journal will be issued bimonthly. One volume of 500 pages will be issued each year and the subscription price will be $6.00. Dr. Warren B. Davis of Philadelphia will be the editor and he will have the assistance of a board of twelve associate editors. Subscriptions should be sent to the publishers, The Williams & Wilkins Company, Baltimore 2, Maryland.

◆ ◆

The C. V. Mosby Company

Mosby announces the appointment of Dr. Claude R. Wood as vice-president and editorial consultant.

◆ ◆

University of Washington

Dr. Raymond B. Allen, executive dean on the Chicago Campus of the University of Illinois and dean of the college of medicine, has been appointed president of the University of Washington (succeeding L. W. Sieg), effective September 1, 1946.

Book News

Western Reserve University Centennial History of the School of Medicine

By Frederick C. Waite, Professor Emeritus in Western Reserve University. Western Reserve University Press. 1946. Price, $6.

This is more than a history of one of the nation's outstanding schools of medicine. The author recounts many phases of the rise of the medical profession from Colonial times to the present, emphasizing the most eventful century in medicine, surgery, and the prevention of disease. It is an elaborate and detailed account, done with careful scholarship, by a recognized authority on medical history. The School of Medicine of Western Reserve University was founded in 1843. The part it has taken in advancing medical education and in research only emphasizes the value of the book in medical history, even in the more specialized chapters. This history is intended to be a valuable reference book for libraries both general and private. It contains a wealth of material for those who are interested in reading medical history, as well as for those who write on medical subjects.

◆ ◆

Preventive Medicine and Public Health

By Wilson G. Smillie, M.D., Professor of Public Health and Preventive Medicine, Cornell University Medical College. The Macmillan Company, New York. 1945. Price, $6.

This is a much needed book. It presents the point of view that preventive medicine is an essential part of the practice of medicine. The material presented is drawn from actual experience and is illustrated by case histories. It gives limited consideration to topics formerly presented in hygiene courses and does not discuss to any great extent sanitary engineering. It stresses the responsibility of the practicing physician in the promotion of individual, family and community health. Of special interest is the section on the "adequacy of medical care."

◆ ◆

The Physiological Basis of Medical Practice

By Charles H. Best, M.D., Professor and Head of the Department of Physiology, and Norman B. Taylor, M.D., Professor of Physiology, University of Toronto. Ed. 4. The Williams & Wilkins Company, Baltimore. 1945. Price, $10.

Expresses the purpose and methods of modern scientific medicine that draws the clinic and the laboratory into common ground and then launches a joint attack on disease. An excellent text; deservedly popular.

Physical Chemistry of Cells and Tissues

By Rudolf Hoeber, University of Pennsylvania School of Medicine, Department of Physiology, and four collaborators. The Blakiston Company, Philadelphia. 1945. Price, $9.

A book of original research recording the results of extensive studies in various fields of physical chemistry in their application to general and medical physiology.

◆ ◆

The Newspaper: Its Making and Its Meaning

By Members of the Staff of the New York Times. Charles Scribner's Sons, New York. 1945. Price, $2.

The book is composed of addresses delivered by editors and staff members of the New York Times to New York public school teachers under the auspices of the Board of Education.

◆ ◆

Manual of Psychological Medicine

By A. F. Tredgold, M.D., Consulting Physician, University College Hospital, London. Ed. 2. The Williams & Wilkins Company, Baltimore. 1945.

Deals with all mental disorders, irrespective of origin.

◆ ◆

Principles of Dynamic Psychiatry

By Jules H. Masserman, M.D., Department of Medicine, University of Chicago. W. B. Saunders Company, Philadelphia. 1945.

The glossary of psychiatric terms is one of the good features of this book, but was it necessary to use up 30 pages to publish references, especially since such a list never can be complete and adds nothing of help to the reader? Part I defines the scope of psychiatry and presents a critical consideration of the various theories of behavior. Part II attempts to reformulate and integrate these theories into a biodynamic organon of behavior. It is a thorough discussion of the subject.

◆ ◆

Personality in Arterial Hypertension

By C. A. L. Binger, N. W. Ackerman, A. E. Cohn, H. A. Schroeder and J. M. Steele. A Psychometric Medicine Monograph. Published with the sponsorship of the American Society for Research in Psychometric Problems. New York. 1945.

Presentation of 24 case histories and tables.

Structure and Function of the Human Body

By Ralph N. Bailiff, Ph.D., Assistant Professor of Anatomy, Louisiana State University School of Medicine, and Donald L. Kimmel, Ph.D., Associate Professor of Anatomy, Temple University School of Medicine. J. B. Lippincott Company, Philadelphia. 1945. Price, $3.

Written in simple language to give the student a preliminary survey of the structure and function of the human body, so that he can acquaint himself with the working materials and follow a pattern of study that will orient him in forming a scientific concept of the body and its parts. A good idea.

◆ ◆

Pathology in Surgery

By Nathan C. Foot, M.D., Professor of Surgical Pathology, Cornell University Medical College. J. B. Lippincott Company, Philadelphia. 1945. Price, $10.

A guide to the surgical pathology of those disorders in which operations are carried out and organs and other specimens removed either as a remedial measure or for the specific purpose of obtaining biopsies leading to pathologic examinations and diagnosis. Reading is facilitated by the double column arrangement. The text is clarified by about 400 excellent illustrations, 20 in full color.

Exercises in Human Physiology

By Sir Thomas Lewis, M.D., Physician in Charge of Clinical Research, University College Hospital, London. Macmillan and Co., New York. 1945. Price, $1.25.

A brief review of essentials of physiology preparatory to entering on clinical studies. This should be a "must" book for every medical student. It will be a great help in clarifying his studies.

◆ ◆

Personality Factors in Counseling

By Charles A. Curran, Ph.D., St. Charles College, Columbus, Ohio. Grune & Stratton, New York. 1945. Price, $4.

A study of a human personality in the process of growth and development. The book has wide philosophical and social implications.

◆ ◆

Howell's Textbook of Physiology

Edited by John F. Fulton, M.D., Sterling Professor of Physiology, Yale University School of Medicine, with Collaborators. Ed. 15. W. B. Saunders Company, Philadelphia. 1945.

This work does not need an introduction nor comment. Any book which survives 14 editions must be a good book. This is.